IBM Tivoli Storage Manager
for Macintosh

Backup-Archive Clients Installation and User's Guide

Version 5 Release 2

GC32-0787-03

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Note
Before using this information and the product it supports, read the general information under “Notices” on page 127.

Fourth Edition (April 2003)

This edition applies to version 5, release 2, modification 0 of IBM Tivoli Storage Manager (5698-ISM), IBM Tivoli Storage Manager Extended Edition (5698-ISX), IBM Tivoli Storage Manager for Storage Area Networks (5698-SAN), and to all subsequent releases and modifications until otherwise indicated in new editions or technical newsletters.

Order publications through your IBM representative or the IBM branch office that serves your locality.

Your feedback is important in helping to provide the most accurate and high-quality information. If you have comments about this manual or any other Tivoli Storage Manager documentation, see “Contacting customer support” on page xi.

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About this book

IBM® Tivoli® Storage Manager is a client-server licensed product that provides storage management services in a multi-platform computer environment. The backup-archive client program permits users to back up and archive files from their workstations or file servers to storage, and restore and retrieve backup versions and archived copies of files to their local file systems.

In addition to the backup-archive client, Tivoli Storage Manager includes the following components available on a variety of platforms:

- A *server program* that permits systems to perform as a backup and archive server for distributed workstations and file servers. See “Related publications” on page xi for available server publications.
- An *administrative client program* that you can access from a Web browser or the command line. The program permits an administrator to control and monitor server activities, define storage management policies for backup, archive and space management services, and set up schedules to perform those services at regular intervals. For more information about the Administrative client, see “Related publications” on page xi for available Tivoli Storage Manager Administrator’s Reference publications.
- An *application program interface (API)* that permits you to enhance an existing application with storage management services. When an application is registered with a server as a client node, the application can back up, restore, archive, and retrieve objects from storage. For more information about the Tivoli Storage Manager API, see *IBM Tivoli Storage Manager Using the Application Programming Interface*, GC32-0793.
- A *Web backup-archive client* that permits an authorized administrator, help desk person, or end user to perform backup, restore, archive, and retrieve services using a Web browser on a remote machine.

Who should read this manual

This manual provides instructions for an end-user to install, configure, and use the Tivoli Storage Manager client. For installation information and supported operating system levels, see Chapter 1, “Installing Tivoli Storage Manager”, on page 1. For configuration information, see Chapter 2, “Configuring Tivoli Storage Manager”, on page 7.

This manual assumes that you are familiar with your workstation, your operating system, and your basic system administration.

Technical changes to the text are indicated by vertical lines to the left of the change.

IBM Tivoli Storage Manager Web Site

Technical support information and publications are available at the following address:

`http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html`

By accessing the Tivoli Storage Manager home page, you can access subjects that interest you. You can also access current Tivoli Storage Manager product information.

Conventions used in this book

This book uses the following typographical conventions:

Table 1. Typographical conventions

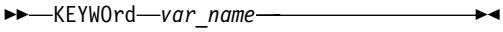
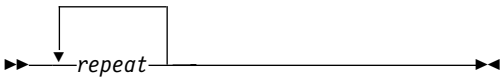
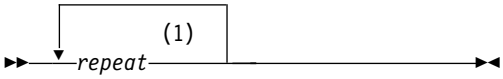
Example	Description
`dsmc.nlm`	A series of lowercase letters with an extension indicates Tivoli Storage Manager program file names.
archive	Boldface type indicates a command that you type at a workstation, such as a command you type on a command line.
dateformat	Boldface italic type indicates a Tivoli Storage Manager option. The bold type is used to introduce the option, or used in an example. Occasionally, file names are entered in boldface italic for emphasis.
filespec	Italicized type indicates either the name of a parameter, a new term, or a placeholder for information that you provide. Italics are also used for emphasis in the text.
`maxcmdretries`	Monospaced type represents fragments of a program or information as it would display on a screen.
plus sign (+)	A plus sign between two keys indicates you should press both keys at the same time.

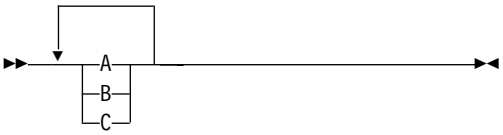
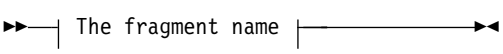
Reading syntax diagrams

This section describes how to read the syntax diagrams used in this manual. To read a syntax diagram, follow the path of the line. Read from left to right, and top to bottom.

- The ►►— symbol indicates the beginning of a syntax diagram.
- The —► symbol at the end of a line indicates the syntax diagram continues on the next line.
- The ►— symbol at the beginning of a line indicates a syntax diagram continues from the previous line.
- The —►◄ symbol indicates the end of a syntax diagram.

Syntax items, such as a keyword or variable, can be:
- On the line (required element)
- Above the line (default element)
- Below the line (optional element).

Syntax diagram description	Example
Abbreviations: Uppercase letters denote the shortest acceptable truncation. If an item appears entirely in uppercase letters, it cannot be truncated. You can type the item in any combination of uppercase or lowercase letters. In this example, you can enter KEYWO, KEYWORD, or KEYWOrd.	
Symbols: Enter these symbols exactly as they appear in the syntax diagram.	***** Asterisk **{ }** Braces **:** Colon **,** Comma **=** Equal Sign **-** Hyphen **()** Parentheses **.** Period Space
Variables: Italicized lowercase items (*var_name*) denote variables. In this example, you can specify a *var_name* when you enter the KEYWORD command.	
Repetition: An arrow returning to the left means you can repeat the item. A character or space within the arrow means you must separate repeated items with that character or space. A footnote by the arrow references the number of times you can repeat the item.	   **Notes:** 1 Specify *repeat* as many as 5 times.

Syntax diagram description	Example
Required choices: When two or more items are in a stack and one of them is on the line, you *must* specify one item. In this example, you *must* choose A, B, or C.	
Optional choice: When an item is below the line, that item is optional. In the first example, you can choose A or nothing at all. When two or more items are in a stack below the line, all of them are optional. In the second example, you can choose A, B, C, or nothing at all.	 
Defaults: Defaults are above the line. The default is selected unless you override it. You can override the default by including an option from the stack below the line. In this example, A is the default. You can override A by choosing B or C. You can also specify the default explicitly.	
Repeatable choices: A stack of items followed by an arrow returning to the left means you can select more than one item or, in some cases, repeat a single item. In this example, you can choose any combination of A, B, or C.	
Syntax fragments: Some diagrams, because of their length, must fragment the syntax. The fragment name appears between vertical bars in the diagram. The expanded fragment appears between vertical bars in the diagram after a heading with the same fragment name.	 **The fragment name:** 

Related publications

Table 2 lists the IBM Tivoli Storage Manager client and server publications that are referred to in this manual.

Table 2. IBM Tivoli Storage Manager client and server publications

Publication title	Order number
Client publications	
IBM Tivoli Storage Manager Messages	GC32-0767
IBM Tivoli Storage Manager for Windows Backup-Archive Clients Installation and User's Guide	GC32-0788
IBM Tivoli Storage Manager for NetWare Backup-Archive Clients Installation and User's Guide	GC32-0786
IBM Tivoli Storage Manager for UNIX Backup-Archive Clients Installation and User's Guide	GC32-0789
Server publications	
IBM Tivoli Storage Manager for AIX Quick Start	GC32-0770
IBM Tivoli Storage Manager for HP-UX Quick Start	GC32-0774
IBM Tivoli Storage Manager for Linux Quick Start	GC23-4692
IBM Tivoli Storage Manager for OS/390 and z/OS Quick Start	GC32-0777
IBM Tivoli Storage Manager for OS/400 PASE Quick Start	GC23-4696
IBM Tivoli Storage Manager for Sun Solaris Quick Start	GC32-0780
IBM Tivoli Storage Manager for Windows Quick Start	GC32-0784

Downloading or ordering publications

All Tivoli publications are available for electronic download or order from the IBM Publications Center: http://www.ibm.com/shop/publications/order/.

The Tivoli Storage Manager publications are available on the following CD-ROM:

Tivoli Storage Manager Publications Version 5.2, SK3T-8176

The format of the publications is PDF and HTML.

The International Technical Support Center (ITSC) publishes Redbooks, which are books on specialized topics such as using Tivoli Storage Manager to back up databases. You can order publications through your IBM representative or the IBM branch office serving your locality. You can also search for and order books of interest to you at the IBM Redbooks Web site at this address:

`http://www.ibm.com/redbooks/`

Contacting customer support

For support for this or any Tivoli product, you can contact Tivoli Customer Support in one of the following ways:

- Visit the Tivoli Storage Manager technical support Web site at:

  `http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html`

- Submit a problem management record (PMR) electronically at **IBMSERV/IBMLINK**. You can access the IBMLINK from the IBM Web site at:
  `http://www.ibm.com/ibmlink/`
- Submit a problem management record (PMR) electronically from the Tivoli Web site at:
  `http://www.ibm.com/software/support/probsub.html.`

Customers in the United States can also call 1-800-IBM-SERV (1-800-426-7378).

International customers should consult the Web site for customer support telephone numbers.

Hearing-impaired customers should visit the TDD/TTY Voice Relay Services and Accessibility Center Web site at:http://www.ibm.com/able/voicerelay.html.

You can also review the *IBM Software Support Guide*, which is available on our Web site at http://techsupport.services.ibm.com/guides/handbook.html.

When you contact IBM Software Support, be prepared to provide identification information for your company so that support personnel can readily assist you. Company identification information is needed to register for online support available on the Web site.

The support Web site offers extensive information, including a guide to support services (IBM Software Support Guide); frequently asked questions (FAQs); and documentation for all IBM Software products, including Release Notes, Redbooks, and white papers, defects (APARs), and solutions. The documentation for some product releases is available in both PDF and HTML formats. Translated documents are also available for some product releases.

We are very interested in hearing about your experience with Tivoli products and documentation. We also welcome your suggestions for improvements. If you have comments or suggestions about our documentation, please complete our customer feedback survey at:

`http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html`

by selecting the Feedback link in the left navigation bar.

Reporting a problem

Please have the following information ready when you report a problem:

- The Tivoli Storage Manager server version, release, modification, and service level number. You can get this information by entering the **query status** command at the Tivoli Storage Manager command line.
- The Tivoli Storage Manager client version, release, modification, and service level number. You can get this information by entering `dsmc` at the command line.
- The communication protocol (for example, TCP/IP), version, and release number you are using.
- The activity you were doing when the problem occurred, listing the steps you followed before the problem occurred.
- The exact text of any error messages.

Internet

You can get additional information through an anonymous FTP server, ftp://ftp.software.ibm.com. IBM Tivoli Storage Manager information is in the /storage/tivoli-storage-management directory.

A newsgroup, *listserv@marist.edu*, is implemented by a third party. IBM supports this newsgroup on a best-effort basis only. See “Online forum” on page 23 for more information.

Chapter 1. Installing Tivoli Storage Manager

The Tivoli Storage Manager backup-archive client helps you protect information on your workstation. Using Tivoli Storage Manager, you can maintain backup versions of your workstation files that you can restore if the original files are damaged or lost. You can also archive workstation files that you do not currently need, or preserve them in their current state, and retrieve them when necessary.

Attention: *On Macintosh OS X, you must have a system administrator ID and password to perform Tivoli Storage Manager tasks.*

You can use the Tivoli Storage Manager graphical user interface (GUI) to perform tasks. The main window displays buttons labeled: **Backup**, **Restore**, **Archive**, and **Retrieve**. To initiate a task, click on the appropriate button.

This chapter provides migration, environment, and installation information for the Tivoli Storage Manager client. After installation, see Chapter 2, "Configuring Tivoli Storage Manager", on page 7 for required configuration tasks to perform before using Tivoli Storage Manager.

Migrating from earlier versions

Upgrade path for clients and servers

As part of a migration plan from Tivoli Storage Manager version 5.1 to Tivoli Storage Manager version 5.2, Tivoli Storage Manager clients and servers can be upgraded at different times. To help prevent disruption to your backup and archive activities during the migration, note the following:

- A Tivoli Storage Manager version 5.1 client can perform backup, restore, archive, and retrieve functions to a Tivoli Storage Manager version 5.2 server.
- A Tivoli Storage Manager version 5.2 client can perform backup, restore, archive, retrieve, and query functions to a Tivoli Storage Manager version 5.1 server.
- A Tivoli Storage Manager V5.1 client can perform V3.1 functional level backup, restore, archive and retrieve functions to a Tivoli Storage Manager Version 3.1 server on VM.
- Data that has been backed up or archived from a Tivoli Storage Manager version 5.2 client to any Tivoli Storage Manager server can be restored or retrieved using a Tivoli Storage Manager version 5.1 client, except for Unicode file systems backed up or queried by the version 5.2 Macintosh client.
- Data that has been backed up or archived from a Tivoli Storage Manager version 5.1 client to any Tivoli Storage Manager server can be restored or retrieved using a Tivoli Storage Manager version 5.2 client.

Migrating to the Unicode-enabled client

Unicode is a universal character encoding standard that supports the interchange, processing, and display of text that is written in any of the languages of the modern world. Unicode-enabled file spaces provide support for multi-lingual workstations without regard for the current locale. Beginning with Tivoli Storage Manager version 5.2, the Macintosh client is Unicode enabled. The Unicode-enabled client supports Unicode for file, directory, and file space names.

Benefits of using the Unicode-enabled client

- If you back up or archive objects with a Unicode-enabled client, you can restore or retrieve these objects with a Unicode-enabled client in any other supported language environment. For example, a Japanese Unicode-enabled client can restore files backed up by German Unicode-enabled client.
- The Unicode-enabled client is cross language, meaning that it works with files using different code pages. The Unicode-enabled client can handle a mixture of files from different code pages or locales in the same file space.
- Without the support for storing Unicode-enabled file spaces, some earlier Macintosh clients have experienced backup failures. This occurs when file spaces contain names of directories or files in multiple languages or have names that cannot be converted to the client's current code page.

How to migrate to the Unicode-enabled client

To migrate to the Unicode-enabled version 5.2 client, the server must be a version 4.2.0 or later level. New clients storing data on the server for the first time require no special set up. In this case, the server automatically stores data in Unicode-enabled file spaces. However, if your client already stores data on the server, you need to plan for the migration of your file spaces to Unicode-enabled file spaces. This involves renaming your file spaces on the server and creating new Unicode-enabled file spaces on the server using the ***autofsrename*** option.

The administrator can specify three possible values using the server ***autofsrename*** option: `yes`, `no`, or `client`. Note that the server setting for this option overrides the setting on the client.

- If the server specifies `no`, the existing file spaces for your node are not renamed or Unicode enabled, even if you have a Unicode-enabled client installed.
- If the server specifies `yes`, and the client performs an incremental backup with ***domain***=*all-local*, all file spaces specified in the current operation that are not Unicode enabled are renamed. The Unicode-enabled client then creates new Unicode-enabled file spaces.

  If the client performs a selective backup, only the file spaces you specify in the current operation are renamed and Unicode enabled.
- If the server specifies `client`, the client can set the ***autofsrename*** option in the TSM System Preferences file to `prompt`, `yes`, or `no`. If the client sets the option to `no`, the file spaces that are not Unicode enabled are not renamed and are not Unicode enabled. If the client specifies *prompt*, the client prompts you whether to rename file spaces. The client prompts you only once to rename a particular file space.

Optionally, your administrator can rename the file spaces on the server that are not Unicode enabled.

For options and results when using the ***autofsrename*** option, see the table below.

Server option	Client option	Result
Yes	Prompt, Yes, No	Renamed
No	Prompt, Yes, No	Not Renamed
Client	No	Not Renamed
Client	Yes	Renamed
Client	Prompt	Based on User Response

For detailed information about the ***autofsrename*** option, see "Autofsrename" on page 67. For additional information about working with the Macintosh clients, see:

- "Considerations for Unicode-enabled clients" on page 13
- "Inclexcl" on page 85

Considerations for migrating to the Unicode-enabled client

When migrating to the Tivoli Storage Manager Macintosh OS X client, please consider the following:

1. To support Unicode functionality, the Macintosh OS X Unicode-enabled client must connect to a version 4.2.0 or higher server.
2. Ensure that you install the fonts for the languages you want to display. If you do not have the necessary fonts installed, the file names and archive descriptions may not display properly. However, the Unicode-enabled clients can still back up, restore, archive, and retrieve the files and directories.
3. The name of the Unicode-enabled file space may be unreadable if the server cannot display the Unicode name. In this case, use the file space identifier (fsID) of the file space to identify these file spaces on the server. On the GUI main window, select the **File details** option from the **View** menu to display the fsID of a file space.
4. After installing a Unicode-enabled client, we recommend that you perform a full incremental backup to rename all existing file spaces that are not Unicode enabled and back up the files and directories within them under the new Unicode-enabled file spaces.
5. Renamed file spaces remain on the server and managed as stabilized file spaces. *These file spaces contain all the original data, which can still be restored until the file spaces are deleted.*
6. When an existing file space is renamed during Unicode conversion, any access rules defined for the file space remain applicable to the original file space. However, new access rules must be defined to apply to the new Unicode file space, if necessary.
7. The server stores information about each node, and once a node logs onto the server using a Unicode-enabled client, the node cannot log on with a version of the client that does not support Unicode. The server allows *only* a Unicode-enabled client to restore files from a Unicode-enabled file space.
8. When backing up files to a file space that is not Unicode enabled, the Unicode-enabled client skips the files and directories with names containing characters from a code page other than the current locale.
9. If files and directories with names containing characters from a code page other than the current locale were previously *backed up with a client that was not Unicode enabled*, Tivoli Storage Manager will *expire* them in the file space that is not Unicode enabled. However, the Unicode-enabled client can back up or archive these files to a Unicode-enabled file space.
10. When migrating from a client that is not Unicode enabled to a Unicode client, file names with double-byte characters mixed with single-byte characters may be restored in mixed single-byte character set (SBCS) format. This is only a display issue.
11. When a client performs a selective backup of an object and the original file space is renamed, the new Unicode-enabled file space contains only that object. Tivoli Storage Manager will back up all other directories and file spaces during the next full incremental backup.

Macintosh client environment requirements

This section contains client environment information, Tivoli Storage Manager client components, and hardware and software requirements for the Macintosh client.

Attention: For current information concerning the client environment prerequisites for all Tivoli Storage Manager supported client platforms, refer to the README file that is shipped on the product installation media or go to the Web site at:

http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html

Client components

- Backup-archive client (GUI)

Hardware requirements

- Any PowerBook or Power Macintosh personal computer (G3 or higher)
- Disk space: see the README file that is shipped on the product installation media.
- Memory: 128 MB for Macintosh OS X.1.5 or higher

Software requirements

- Macintosh OS X.1.5 or higher

Communications method

To use this communication method:	Install this software:	To connect to these Tivoli Storage Manager servers:
TCP/IP	Sockets for Mac X, which comes standard with the OS.	AIX, HP-UX, Linux, OS/390, OS/400 PASE, Solaris, VM, Windows, z/OS

Installing the Macintosh client program (required)

The Tivoli Storage Manager Macintosh client is included on the desktop client installation CD-ROM in the tsmcli/mac directory structure.

You can display online startup information, product manuals, and README files. On a Web browser:

1. Click **File** and then click **Open File**.
2. Select the CD-ROM drive.
3. Select the **START.HTM** file.

To install the Tivoli Storage Manager Macintosh client, you must be a system administrator. During the installation, TSM Backup Help is added to the Mac Help Center. The first time Tivoli Storage Manager is run, the preference folder: <Startup Disk>:Library:Preferences:Tivoli Storage Manager (where <Startup Disk> is the name of the current startup disk) is created.

Preparing for installation from the client CD-ROM

To prepare for installation from the client CD-ROM, follow these steps:

1. Insert the CD-ROM into the CD-ROM drive.
2. Double-click on the CD-ROM icon.

3. Go to the clients:mac folder.
4. Drag the file tsminst.hqx directly from the CD-ROM to your hard drive. If you FTP the file from another workstation that has mounted the CD-ROM, ensure it is transferred in ASCII mode.
5. Locate a BinHex converter. The Tivoli Storage Manager Macintosh installation file is stored in BinHex format. You must convert this file before installation by using a BinHex translator. Programs such as Stuffit Deluxe and Compact Pro can convert the files. Also, a freeware program called BinHex 4.0 can be found at most major FTP sites (including ftp.apple.com) and from online services, such as CompuServe and America Online.
6. Use the BinHex translator and choose the HQX file located on your hard drive. Save the converted file to your hard drive. An installation program called **TSM Installer** is created on your hard drive after you finish the BinHex conversion.

Installing the program

To install the program, follow these steps:

1. Double-click on the **TSM Installer** program icon.
2. When the Tivoli Storage Manager installation window appears, click on the **Continue** button.
3. When the README file appears, read through the file to learn about recent updates and product changes. You can print this file for later reference by clicking on the **Print** button. When you have finished reading this file, click on the **Continue** button.
4. The **TSM Backup Standard Install** window displays:
   a. Select **Install** to install the standard installation package which includes the Tivoli Storage Manager Backup Program.
   b. Select **Custom** if you want to customize the standard installation package.
5. Decide where you want to store the Tivoli Storage Manager files, and type the desired folder name in the installation folder field in the installation window. **Tivoli Storage Manager** is the default folder. If you choose a folder name that is not already listed, a new folder is created for you. Click on the **Install** button to begin the installation process.
6. You are asked whether you want the Tivoli Storage Manager scheduler daemon to start automatically when you start your system:
   - If you select **Yes**, Tivoli Storage Manager automatically places an alias scheduler daemon in your startup folder.
   - If you select **No**, see Chapter 7, “Automating tasks”, on page 45 for more information about starting the Tivoli Storage Manager scheduler after installation.

   Note: You will not be prompted to set up the daemon to start automatically. See Chapter 7, “Automating tasks”, on page 45 for instructions on how to start the daemon automatically at login time
7. After installation completes, you are asked if you want to quit, restart if you are finished, or perform further installations. After installation, see Chapter 2, “Configuring Tivoli Storage Manager”, on page 7 for required configuration tasks to perform before using Tivoli Storage Manager.

Notes:

1. During the installation TSM Backup Help is added to the Mac Help Center.
2. The first time you run Tivoli Storage Manager, the preference folder is placed in the following path:

   ```
   <Startup Disk>:Library:Preferences:Tivoli Storage Manager
   ```

where <Startup Disk> is the name of the current startup disk. The permissions on this folder are set to 775. To edit this file, you may need to change the file permissions in a terminal window using the following command:

```
sudo chmod 774 <filename>
```

Updating a previously installed version of Tivoli Storage Manager

To update a previously installed version of Tivoli Storage Manager, navigate to the folder that contains the Tivoli Storage Manager folder, then enter the name of the folder where the Tivoli Storage Manager files reside in the installation folder field in the installation window. The installer installs the updated files into this folder and overwrites the old Tivoli Storage Manager files, but does not replace any existing preferences files. Click on the **Install** button to begin the automatic installation update process.

Note: There is no automated process to assist with importing your options from a previous version of Tivoli Storage Manager. It might be easier to open the old option file in a text editor, then use the Configuration Assistant and the Preference editor to set the options to the values in the old preference file.

Tivoli Storage Manager server installation and configuration

The Tivoli Storage Manager clients work in conjunction with the Tivoli Storage Manager server. Contact your Tivoli Storage Manager administrator to obtain client access to the Tivoli Storage Manager server, or refer to the following publications to install and configure a Tivoli Storage Manager server:

Table 3. Tivoli Storage Manager server Quick Start publications

Publication title	Order number
IBM Tivoli Storage Manager for AIX Quick Start	GC32-0770
IBM Tivoli Storage Manager for HP-UX Quick Start	GC32-0774
IBM Tivoli Storage Manager for Linux Quick Start	GC23-4692
IBM Tivoli Storage Manager for OS/390 and z/OS Quick Start	GC32-0777
IBM Tivoli Storage Manager for OS/400 PASE Quick Start	GC23-4696
IBM Tivoli Storage Manager for Sun Solaris Quick Start	GC32-0780
IBM Tivoli Storage Manager for Windows Quick Start	GC32-0784

Chapter 2. Configuring Tivoli Storage Manager

After installation, *required* configuration tasks include the following:

Task	Page
Creating and modifying the system preferences file (required)	7
Creating and modifying a user preferences file (required)	8
Registering your workstation with a server (required)	11

Optional configuration tasks include the following:

Task	Page
Creating an include-exclude list (optional)	11
Creating multiple user preferences files (optional)	19

Attention: For current information concerning the client configuration for all Tivoli Storage Manager supported client platforms, refer to the `README` file that is shipped on the product installation media.

On Macintosh OS X, you must have a system administrator ID and password to perform Tivoli Storage Manager tasks.

Creating and modifying the system preferences file (required)

During installation, Tivoli Storage Manager provides a sample System Preferences file called TSM System Preferences-Sample. Use this file to specify one or more servers to contact for services, and the communications options for each server. This file can also include authorization options, backup and archive processing options, and scheduling options.

By default, Tivoli Storage Manager places the TSM System Preferences-Sample file in the TSM Application folder (the location where the Tivoli Storage Manager client was installed). You can copy and rename the TSM System Preferences-Sample file to TSM System Preferences and leave this file in the TSM Application folder.

If you use the Tivoli Storage Manager Setup Assistant to create the TSM System Preferences file, this file is created in the following location:

```
<Startup Disk>:Library:Preferences:Tivoli Storage Manager
```

where <Startup Disk> is the name of the current startup disk.

If the TSM System Preferences file exists in both the TSM Application folder and the path created by the Tivoli Storage Manager Setup Assistant, the TSM System Preferences file created by the Setup Assistant takes precedence.

If you are a system administrator, you can modify the required options in your TSM System Preferences file according to your needs. The following options are required to establish communication with a Tivoli Storage Manager server:

```
SErvername     server1
  COMMMethod                TCPip
  TCPPort                   1500
  TCPServeraddress          node.domain.company.com
```

See Chapter 9, “Using processing options”, on page 59 for more information about these options.

Use one of the following methods to modify the TSM System Preferences file:
- Click **Utilities** → **Setup Assistant** from the Tivoli Storage Manager client GUI.
- Click **Edit** → **Preferences** from the Tivoli Storage Manager client GUI.
- Use your favorite text editor. Ensure that you save the file as plain text. See “Setting options in a preferences file” on page 10 for information on how to set options in the TSM System Preferences file.

  Notes:
  1. If you want to edit the TSM System Preferences file located in <Startup Disk>:Library:Preferences:Tivoli Storage Manager, you may need to change the file permissions in a terminal window using the following command:

     ```
     sudo chmod 774 <filename>
     ```
  2. The TSM System Preferences file must be a plain text file. By default, TextEdit does not save files as plain text. Select **Format** → **Make PlainText** to save the TSM System Preferences file as a plain text file. Do not add the `.txt` extension.
  3. If you enter an invalid option in a Preferences file, you cannot use the Setup Assistant or the Preference editor to remove the invalid option. You can remove the invalid option using a text editor.

If you update the TSM System Preferences file during a session, you must restart the client to pick up the changes.

See “Setting options in a preferences file” on page 10 for information on how to set options in the TSM System Preferences file.

Creating and modifying a user preferences file (required)

During installation, Tivoli Storage Manager provides a sample User Preferences file called TSM User Preferences-Sample. By default, Tivoli Storage Manager places the TSM User Preferences-Sample file in the TSM Application folder (the location where the Tivoli Storage Manager client was installed). You can copy and rename the TSM User Preferences-Sample file to TSM User Preferences and leave this file in the TSM Application folder.

If you use the TSM Setup Assistant to create the TSM User Preferences file, this file is created in the following location:

```
<Startup Disk>:Library:Preferences:Tivoli Storage Manager
```

where <Startup Disk> is the name of the current startup disk.

If the TSM User Preferences file exists in both the TSM Application folder and the path created by the Tivoli Storage Manager Setup Assistant, the TSM User Preferences file created by the Setup Assistant takes precedence.

If you are a system administrator, you can modify the TSM User Preferences file according to your needs. This file can contain the following options:
- Communication options

- Backup and archive processing options
- Restore and retrieve processing options
- Scheduling options
- Format and language options
- Authorization options
- Error processing options
- Transaction processing option

See Chapter 9, “Using processing options”, on page 59 for more information about these options.

Use one of the following methods to modify the TSM User Preferences file:
- Click **Utilities → Setup Assistant** from the Tivoli Storage Manager client GUI.
- Click **Edit → Preferences** from the Tivoli Storage Manager client GUI.
- Use your favorite text editor. Ensure that you save the file as plain text. See “Setting options in a preferences file” on page 10 for information on how to set options in the TSM User Preferences file.

  Notes:
  1. If you want to edit the TSM User Preferences file located in <Startup Disk>:Library:Preferences:Tivoli Storage Manager, you may need to change the file permissions in a terminal window using the following command:

     ```
     sudo chmod 774 <filename>
     ```
  2. The TSM User Preferences file must be a plain text file. By default, TextEdit does not save files as plain text. Select **Format → Make PlainText** to save the TSM User Preferences file as a plain text file. Do not add the `.txt` extension.

If you update the TSM User Preferences file during a session, you must restart the client to enable the changes.

Considerations:
- The TSM User Preference file contains type and creator codes which allow Tivoli Storage Manager to be launched by dragging and dropping the file on the Mac OS X Backup application.
- Double clicking on the TSM User preference file will start the TSM Backup application. Tivoli Storage Manager will start, but will respond that you must use the Mac OS X Backup application. Double clicking will work as expected only if the root user account is enabled and logged on.
- To maintain the *drag-n-drop* functionality, the TSM User Preference creator code must be retained. Using TextEdit to modify the TSM User Preference file will cause the creator code to be removed. You can use SimpleText successfully edit the file and retain the creator code. SimpleText is a Classic application. Most commercially available editors will also preserve the creator code.
- The Developers Tools CD that comes with Mac OS X has a Mac OS X version of SimpleText. You can use this version of SimpleText to edit the preference files without converting them to plain text. Unfortunately, this will cause the drag-n-drop functionality to be lost. To install the Developers Tools, double click on the Developer.pkg file and follow the on-screen instructions. SimpleText is installed in the Developer:Examples:Carbon directory.
- TSM User Preference files that you create using the Setup Assistant have the creator code. If the creator code is ever removed from your preference file, rename your existing file, use the setup assistant to create a new one, then use a text editor to replace the contents of the new file with your original preferences.
- From a terminal window, you can use vi or pico to edit the preference files. Either of these editors will show the line endings as ^m characters. The ^m character can be replaced by deleting the character and making a new line.

However, this will cause the line endings to show up as odd characters in SimpleText. Tivoli Storage Manager will handle preference files edited with vi or pico line endings.

See “Setting options in a preferences file” for information on how to set options in the TSM User Preferences file.

Setting options in a preferences file

This section describes how to set options in your TSM System Preferences file or TSM User Preferences file.

Notes:

1. If you want to edit the TSM User Preferences file located in <Startup Disk>:Library:Preferences:Tivoli Storage Manager (where <Startup Disk> is the name of the current startup disk), you may need to change the file permissions in a terminal window using the following command:

   ```
   sudo chmod 774 <filename>
   ```

2. The TSM System Preferences file must be a plain text file. By default, TextEdit does not save files as plain text. Select **Format → Make PlainText** to save the TSM System Preferences file as a plain text file. Do not add the `.txt` extension.

To set an option in this file, enter the option name and one or more blank spaces, followed by the option value. For example:

```
compression  yes
nodename     client_a
```

Some options consist of only the option name, such as ***verbose*** and ***quiet***. You can enter the entire option name or its abbreviation. For example, you can specify the ***verbose*** option as either of the following:

```
verbose
ve
```

Follow these additional rules when entering options in your Preferences file:

- Do not enter comments on the same line as an option.
- Indent options with spaces or tabs.
- Begin each comment with an asterisk (*) as the first character in a line.
- Enter each option on a separate line and enter all parameters for an option on the same line. For example, to specify two different volumes as your default client domain, you could enter the following:

  ```
  domain  "La Pomme" "Macintosh HD"
  ```

- Enter one or more blank spaces between parameters.
- Use blank lines between options.
- The maximum number of characters in a file name is 255. The maximum combined length of the file name and path name is 1024 characters. Long file name support is provided while running Tivoli Storage Manager on Macintosh X. The maximum length of a file name is limited to 504 bytes (not characters). Because the Unicode representation of a character may occupy several bytes, the maximum number of characters that a file name may contain can vary.

If you update the Preferences file while a GUI session is active, you must restart the client to pick up the changes.

Registering your workstation with a server (required)

Before you can use Tivoli Storage Manager, your client must be registered with the server. The process of setting up a node name and password is called *registration*. There are two types of registration: *open* and *closed*. Your administrator chooses the type of registration for your site.

Using closed registration

With closed registration, an administrator must register your workstation as a client node with the server. If your enterprise uses closed registration, you must provide the following information to your Tivoli Storage Manager administrator:

- Your node name (the name of your workstation or the node name you specified with the ***nodename*** option).
- The initial password you want to use, if required.
- Contact information, such as your name, user ID, and phone number.

In addition to possibly defining certain options in your Preferences file, your administrator defines the following for you:

- The policy domain to which your client node belongs. A policy domain contains policy sets and management classes, defined by your administrator, that control how Tivoli Storage Manager manages the files you back up and archive.
- Whether you can compress files before sending them to the server.
- Whether you can delete backup and archive data from server storage.

Using open registration

With open registration, you can register your workstation as a client node with the server.

The first time you start a session, Tivoli Storage Manager prompts you for information necessary to register your workstation with the server identified in your TSM User Preferences file. You need to supply your node name, a password, and contact information.

When you use open registration:

- Your client node is assigned to a policy domain named **standard**.
- You can define whether or not to compress files before sending them to the server. See “Compression” on page 74 for more information about the ***compression*** option.
- You can delete archived copies of files from server storage, but not backup versions of files.

If necessary, your administrator can change these defaults later.

Creating an include-exclude list (optional)

This is an optional task but an important one. If you do not create an include-exclude list, Tivoli Storage Manager considers all files for backup services and uses the default management class for backup and archive services. For information on management classes and policy domains, see Chapter 8, “Understanding storage management policies”, on page 49.

You can create an include-exclude list to exclude a specific file or groups of files from backup services, and to assign specific management classes to files. Tivoli Storage Manager backs up any file that is not explicitly excluded. You should exclude Tivoli Storage Manager client folders from backup services.

Attention: There are some system files that you should exclude. See "Excluding system files" on page 15 for more information.

Specify your include-exclude list in your TSM System Preferences file. If you define more than one server in your TSM System Preferences file, each server must have its own include-exclude list. The include-exclude list can also go into a separate file, which is pointed to by the ***inclexcl*** option.

The TSM System Preferences file must be in a non-Unicode format. However, if you are using a separate include-exclude file, it can be in Unicode or non-Unicode format. If you specify a non-Unicode include-exclude file, the file must be in the same code page that the client is running. For example, a non-Unicode include-exclude file on an English Macintosh system cannot contain Japanese characters.

When the client processes include-exclude statements, the include-exclude statements within the include-exclude file are placed at the position occupied by the ***inclexcl*** option in TSM System Preferences file, in the same order, and processed accordingly.

See "Inclexcl" on page 85 for detailed information about specifying an include-exclude file using the ***inclexcl*** option.

You can use the following method to create an include-exclude list or specify an include-exclude file:

1. From the client GUI, open the **Edit** menu and select **Preferences**.
2. In the Preferences dialog, click the **Include/Exclude** section.

Note: You can specify a Unicode file as an include-exclude file using the Preferences editor. However, you cannot create the Unicode file using the Preferences editor. See "Considerations for Unicode-enabled clients" on page 13 for instructions on creating a Unicode include-exclude file.

You can also create an include-exclude list by performing the following steps:

1. Determine your include and exclude requirements.
2. Open your TSM System Preferences file with SimpleText or another Macintosh text editor.
3. Locate the server stanza in your TSM System Preferences file.
4. Enter your ***include*** and ***exclude*** statements using the appropriate include-exclude options as described in "Using include-exclude options" on page 13. Because Tivoli Storage Manager processes your include-exclude list from the bottom of the list up, it is important to enter all your include-exclude statements in the proper order. For example, in the following include-exclude list the `includefile.cpp` file *is not* backed up:

   ```
   include "La Pomme:Documents:includefile.cpp"
   exclude "La Pomme:Documents:...:*"
   ```

   However, in the following include-exclude list the `includefile.cpp` file *is* backed up:

   ```
   exclude "La Pomme:Documents:...:*"
   include "La Pomme:Documents:includefile.cpp"
   ```
5. Save the file and close it. Ensure that you save the file as plain text. Do not add the `.txt` extension.

6. Restart your Tivoli Storage Manager client to enable your new TSM System Preferences file.

You can specify a separate include-exclude file using the ***inclexcl*** option. The file can be located in any directory to which all users on your workstation have read access. See "Inclexcl" on page 85 for more information.

Considerations for Unicode-enabled clients

The include-exclude file can be in Unicode or non-Unicode format. If you specify a non-Unicode include-exclude file, that file must be in the same code page the client is running. For example, a non-Unicode include-exclude file on an English Macintosh system can not contain Japanese characters.

A Unicode include-exclude file provides the following benefits:

- Names with characters from another code page no longer have to be wildcarded.
- File names and directories from any code page can be *fully specified* for the Unicode-enabled client to process.

To create an include-exclude file in Unicode format, perform the following steps:

1. Open a text editor.
2. Enter your ***include*** and ***exclude*** statements using the appropriate include-exclude options in "Using include-exclude options".
3. Click **File** and then click **Save As**. The Save As window displays.
4. Select the **Save as Unicode** check box, specify the file and target directory, and save the file.
5. Place an ***inclexcl*** option specifying the include-exclude file you just created in your TSM System Preferences file.
6. Restart the Tivoli Storage Manager client.

Using include-exclude options

This section provides the following information:

- Brief descriptions of the ***include*** and ***exclude*** options that you can specify in your TSM System Preferences file. See table references for more information about each option.
- A minimum include-exclude list that excludes system files.
- A list of supported wildcard characters that you can use to include or exclude groups of files for processing.
- Examples of how you might use wildcard characters with ***include*** and ***exclude*** patterns.

Excluding directories

Use ***exclude.fs*** and ***exclude.dir*** statements to exclude all files and sub-directories in the specified directory from processing. Tivoli Storage Manager evaluates all ***exclude.fs*** and ***exclude.dir*** statements *first* (regardless of their position within the include-exclude list), and removes the excluded file spaces, directories, and files from the list of objects available for processing. The ***exclude.fs*** and ***exclude.dir*** statements override all include statements that match the pattern.

Table 4. Options for excluding file Spaces and directories

Option	Description	Page
exclude.fs	Excludes file spaces matching the pattern. The client does not consider the specified file space for processing and the usual deleted-file expiration process cannot occur. If you exclude a file space that was previously included, existing backup versions remain on the server subject to retention rules specified in the associated management class definition. See "Exclude options" on page 81 for more information.	81
exclude.dir	Excludes a directory, its files, and all its subdirectories and their files from backup processing. For example, the statement exclude.dir test:dan:data1 excludes the test:dan:data1 directory, its files, and all its subdirectories and their files.	81

Controlling backup and archive processing

After Tivoli Storage Manager evaluates all ***exclude.fs*** and ***exclude.dir*** statements, the following options are evaluated against the remaining list of objects available for processing.

If you exclude an object that was previously included, Tivoli Storage Manager marks existing backup versions inactive during the next incremental backup.

Table 5. Options for controlling backup and archive processing

Option	Description	Page
	Backup processing	
exclude ***exclude.backup*** ***exclude.file*** ***exclude.file.backup***	*These options are equivalent*. Use these options to exclude a file or group of files from backup services.	81
include ***include.backup*** ***include.file***	*These options are equivalent*. Use these options to include files or assign management classes for backup processing.	87
	Archive processing	
exclude.archive	Excludes a file or group of files from archive services.	81
include ***include.archive***	*These options are equivalent*. Use these options to include files or assign management classes for archive processing.	87

Controlling compression processing

After Tivoli Storage Manager evaluates ***exclude.fs, exclude.dir*** and any other include-exclude options controlling backup and archive processing, it uses the following options to determine which files undergo compression processing.

Table 6. Options for controlling compression processing

Option	Description	Page
	Compression processing	
exclude.compression	Excludes files from compression processing if ***compression***=*yes* is specified. This option applies to backups and archives.	81
include.compression	Includes files for compression processing if ***compression***=*yes* is specified. This option applies to backups and archives.	87

Excluding system files

The Tivoli Storage Manager client will add the following exclude statements to the include-exclude list in your TSM System Preferences file:

```
exclude.archive "...:Desktop DB"
exclude.backup  "...:Desktop DB"
exclude.archive "...:Desktop DF"
exclude.backup  "...:Desktop DF"
exclude.backup  ":Volumes:...:*"
exclude.archive ":Volumes:...:*"
exclude.archive "<Startup Disk>:.vol"
exclude.backup "<Startup Disk>:.vol"
exclude.archive "<Startup Disk>:automount"
exclude.backup "<Startup Disk>:automount"
exclude.archive "<Startup Disk>:dev"
exclude.backup "<Startup Disk>:dev"
exclude.archive "<Startup Disk>:Network:Servers"
exclude.backup "<Startup Disk>:Network:Servers"
exclude.archive "<Startup Disk>:.vol:...:*"
exclude.backup  "<Startup Disk>:.vol:...:*"
```

where <Startup Disk> will be replaced with the name of the current startup disk.

In addition, we recommend that you have the following minimum include-exclude list in your TSM System Preferences file:

```
Exclude ...:.TheInvisiblePropertyStore
Exclude ...:DeskTop
Exclude ...:etc
Exclude ...:OpenFolderListDF
Exclude ...:TheFindByContentIndex
Exclude ...:tmp
Exclude ...:var
Exclude ...:Wastebasket:...:*
Exclude "...:Norton FileSaver Data"
Exclude "...:Norton VolumeSaver Data"
Exclude "...:Norton VolumeSaver Index"
Exclude "...:VM Storage"
Exclude "...:...:TSM Sched*"
Exclude "...:...:TSM Error*"
Exclude.dir "...:System Folder:Preferences:netscape A:Cache A"
Exclude.dir "...:System Folder:Preferences:Explorer:Temporary Files"
Exclude.dir "...:Desktop Folder"
Exclude.dir "...:System Folder:Preferences:netscape users:...:Cache"
Exclude.dir ...:.Trashes
Exclude.dir ...:System Folder:Preferences:cache-cache
Exclude.dir ...:Trash
Exclude.dir ...:TheFindByContentFolder
Exclude.dir ...:TheVolumeSettingsFolder
Exclude.dir ...:Volumes
Exclude.dir ...:Library:Caches
```

These are system files that cannot be recovered without possibly corrupting the operating system, or temporary files with data that you can easily recreate.

Including and excluding groups of files

To specify groups of files that you want to include or exclude, use the wildcard characters listed in Table 7 on page 16. This table applies to ***include*** and ***exclude*** statements *only*.

Note: A very large include-exclude list may decrease backup performance. Use wildcards and eliminate unnecessary include statements to keep the list as short as possible.

Table 7. Wildcard and other special characters

Character	Function
?	The match one character matches any single character *except* the folder separator; it does not match the end of the string. (See "Matchonechar" on page 93.) For example: • The **pattern** ab?, **matches** abc, but **does not match** ab, abab, or abzzz. • The **pattern** ab?rs, **matches** abfrs, but **does not match** abrs, or abllrs. • The **pattern** ab?ef?rs, **matches** abdefjrs, but **does not match** abefrs, abdefrs, or abefjrs. • The **pattern** ab??rs, **matches** abcdrs, abzzrs, but **does not match** abrs, abjrs, or abkkkrs.
*****	The match-all character. For example: • The **pattern** ab*, **matches** ab, abb, abxxx, but **does not match** a, b, aa, bb. • The **pattern** ab*rs, **matches** abrs, abtrs, abrsrs, but **does not match** ars, or aabrs, abrss. • The **pattern** ab*ef*rs, **matches** abefrs, abefghrs, but **does not match** abefr, abers. • The **pattern** abcd.*, **matches** abcd.c, abcd.txt, but **does not match** abcd, abcdc, or abcdtxt.
...:	Matches all volumes or folders. For example: `...:...:*` matches any file in any folder on any volume. The first group specifies the volume and the second group specifies the folder. **Note:** This consists of three periods followed by a colon, not an ellipsis followed by a colon.
:	The volume or folder separator. It limits the scope of search for matching all characters and matching all volumes.
[	The open character-class character begins the enumeration of a character class. For example: `xxx[abc] matches xxxa, xxxb, or xxxc.`
–	The character-class range includes characters from the first character to the last character specified. For example: `xxx[a-z] matches xxxa, xxxb, xxxc, ... xxxz.` **Note:** For ASCII machines such as the Macintosh, characters represented by the hexadecimal codes of 61 (a) through 7A (z) will match. If the last character in the range is less than the first, only the first is used.
\	The literal escape character. When used within a character class, it treats the next character literally. When used outside of a character class, it is not specially treated.
]	The close character-class character ends the enumeration of a character class.

Examples using wildcards with include and exclude patterns

Table 8 contains examples of ways you might use wildcard characters with ***include*** and ***exclude*** patterns.

Table 8. Using wildcard characters with include and exclude patterns

Task	Pattern
Exclude all files that end with `doc`, except those found on volume `La Pomme` in the `Documents` folder.	`exclude ...:...:*doc` `include "La Pomme:Documents:*doc"`

Table 8. Using wildcard characters with include and exclude patterns (continued)

Task	Pattern
Exclude all files and folders under any Documents folder that might exist, *except* for the file La Pomme:Documents:Current Resume. Include this file.	exclude ...:...:Documents:...:* include "La Pomme:Documents: Current Resume"
Exclude any .cpp file in any folder on the Vol1, Vol2, Vol3, and Vol4 volumes.	exclude "Vol[1-4]:...:*.cpp"
Exclude the .cpp files found in the root folder of the Vol2 volume.	exclude Vol2:*.cpp
Exclude any file found on any volume that resides under the Development folder.	exclude ...:Development:...:*
Exclude a single file system from backup processing.	exclude.fs home:
Exclude all file systems mounted anywhere in the HFS+:svt1:fs01 and HFS+:svt1:fs02 directory tree from backup processing.	exclude.fs HFS+:svt1:* exclude.fs HFS+:svt1:...:*

Processing include and exclude options

The Tivoli Storage Manager server can define include-exclude options using the ***inclexcl*** parameter in a client option set. The include-exclude statements specified by the server are evaluated along with those in the TSM System Preferences file. The server include-exclude statements are always enforced and placed at the bottom of the include-exclude list and evaluated before the client include-exclude statements.

When performing an incremental backup, Tivoli Storage Manager evaluates all ***exclude.fs*** and ***exclude.dir*** statements *first*, and removes the excluded file spaces, directories, and files from the list of objects available for processing. See "Excluding directories" on page 13 and "Exclude options" on page 81 for more information about the ***exclude.fs*** and ***exclude.dir*** options.

After evaluating all ***exclude.fs*** and ***exclude.dir*** statements, Tivoli Storage Manager evaluates the include-exclude list from the bottom up and stops when it finds an include or exclude statement that matches the file it is processing. The order in which the include and exclude options are entered therefore affects which files are included and excluded. See Chapter 9, "Using processing options", on page 59 for more information about the order in which all options are processed.

The client program processes the ***include*** and ***exclude*** options as follows:

1. Folders *are not* checked; files are checked. Therefore, if you have a volume (such as La Pomme) defined using the ***domain*** option, all folders of that volume are backed up *regardless* of what you defined for your ***include*** and ***exclude*** options. This is the case *even if* the files in those folders are not backed up.
2. **File names are compared to the patterns in the include-exclude list from the bottom up.** When a match is found, the processing stops and checks whether the option is ***include*** or ***exclude***. If the option is ***include***, the file is backed up. If the option is ***exclude***, the file *is not* backed up.

   Note: A very large include-exclude list may decrease backup performance. Use wildcards and eliminate unnecessary include statements to keep the list as short as possible.

3. If a match *is not* found, files are implicitly included and backed up.
4. When a file is backed up, it is bound to the default management class unless it matched an ***include*** statement that specified a different management class name, in which case the file is bound to that management class.

The following examples demonstrate *bottom up* processing.

Example 1

Assume that La Pomme is defined as the domain, and that you defined the following statements for the ***include*** and ***exclude*** options.

```
exclude ...:*.cpp
include "La Pomme:Foo:...:*.cpp"
exclude "La Pomme:Foo:Junk:*.cpp"
```

The current file being processed is La Pomme:Foo:Dev:test.cpp. The processing follows these steps:

1. Rule 3 (the last ***include*** or ***exclude*** statement defined) is checked first because of *bottom up* processing. The pattern La Pomme:Foo:Junk:*.cpp does not match the current file name being processed.
2. Processing moves to Rule 2 and checks. This time, pattern La Pomme:Foo:...:*.cpp matches the current file name being processed. Processing stops, the option is checked, and it is ***include***.
3. File La Pomme:Foo:Dev:test.cpp is backed up.

Example 2

Assume that La Pomme is defined as the domain, and that you defined the following statements for the ***include*** and ***exclude*** options.

```
exclude ...:*.cpp
include "La Pomme:Foo:...:*.cpp"
exclude "La Pomme:Foo:Junk:*.cpp"
```

The current file being processed is La Pomme:Widget:Sample File. The processing follows these steps:

1. Rule 3 is checked and finds no match.
2. Rule 2 is checked and finds no match.
3. Rule 1 is checked and finds no match.
4. Because a match is not found, file La Pomme:Widget:Sample File is implicitly included and is backed up.

Example 3

Assume that La Pomme is defined as the domain, and that you defined the following statements for the ***include*** and ***exclude*** options.

```
exclude ...:...:*.cpp
include "La Pomme:Foo:...:*.cpp"
exclude "La Pomme:Foo:Junk:*.cpp"
```

The current file being processed is La Pomme:Lib:Src:Module1.cpp. The processing follows these steps:

1. Rule 3 is checked and finds no match.
2. Rule 2 is checked and finds no match.
3. Rule 1 is checked and a match is found.
4. Processing stops, the option is checked, and it is ***exclude***.
5. File La Pomme:Lib:Src:Module1.cpp is not backed up.

Creating multiple user preferences files (optional)

Some tasks require changes to the User Preferences file. For example, suppose that you want to back up your files to one server and archive them to another. Or, suppose you want to retrieve files to a different workstation. Instead of editing your User Preferences file each time you want to connect to a different server or use a different workstation, you can create multiple User Preferences files. Depending on what you want to do, you can launch Tivoli Storage Manager with a different User Preferences file that suits your needs.

Suppose you have two servers named Alpha and Bravo. Simply create two User Preferences files that are named, for example, Prefs Alpha and Prefs Bravo. When you want to connect to Bravo, locate Prefs Bravo on your desktop and drop it onto the Tivoli Storage Manager icon. Tivoli Storage Manager starts using all options in Prefs Bravo, including the server address.

Notes:

1. Multiple TSM User Preferences files are supported only for the root user on Macintosh OS X.
2. Remember to make duplicates of your original User Preferences file and modify the duplicates. Always keep the original Tivoli Storage Manager Backup Preferences Sample intact.
3. When you create user preferences files, you can double-click them or drop them onto the Tivoli Storage Manager icon. The root user can take advantage of this ability.
4. You can have multiple User Preference files but only one System Preferences file. If you use more than one server, you must have multiple server stanzas in the TSM System Preferences file.

Chapter 3. Getting started

This chapter includes instructions for the following tasks:

Tivoli Storage Manager client authentication

When using the backup-archive GUI you can logon using a nodename and password *or* administrative user ID and password. Tivoli Storage Manager prompts for your user ID and compares it to the configured nodename. If they match, Tivoli Storage Manager attempts to authenticate the user ID as a nodename. If the authentication fails or if the user ID does not match the configured nodename, the client attempts to authenticate the user ID as an administrative user ID.

To use an administrative user ID with any of the backup-archive clients, the user ID must have one of the following authorities:

- *System privilege* - Authority over the entire system.
- *Policy privilege* - Authority over the node's domain.
- *Client owner* - Authority over the configured nodename. With client owner authority, you own the data and have physical access to it.

Client access authority only allows administrators to back up and restore files on remote machines. They do not have physical access to the data. That is, they cannot restore the remote machine's data to their own machines. In order to restore a remote machine's data to your own machine, you must possess at least client owner authority.

You can use the ***virtualnodename*** option to temporarily access your node's data from another machine. This option differs from the ***nodename*** option in that, if the ***passwordaccess*** option is set to *generate* along with the ***virtualnodename*** option, the password is not stored on the local machine. If you specify the ***nodename*** option, the password is stored on the local machine. See "Virtualnodename" on page 126 for more information about the ***virtualnodename*** option.

Starting a GUI session

Start a GUI session using one of the following methods:

- For the root user on Macintosh OS X:
  - Double-click the **TSM Backup** icon.
  - Double-click the TSM User Preferences file.
  - Drag and drop a TSM User Preferences file onto the **TSM Backup** icon
- For Mac OS X non-root users:

– Double-click the **TSM Mac X Backup** icon. You will be prompted for a system administrator ID and password

Tivoli Storage Manager locates the TSM User Preferences file and starts with the preferences specified in that file. See "Creating and modifying a user preferences file (required)" on page 8 for more information about the TSM User Preferences file.

Configuration Assistant

When the GUI client starts, it checks to see whether a TSM System Preferences file exists. If the TSM System Preferences file does not exist (which usually happens after you have installed the client for the first time on your machine), the setup assistant will automatically start and guide you through the configuration process. You can launch the assistant at any time to modify your client configuration files. To do this from the main GUI window, select **Utilities → Setup Assistant**.

The setup wizard is not available through the Web client.

Starting the client scheduler automatically

You can start the client scheduler automatically when you login to your workstation. If the administrator has defined schedules for your node, starting the client scheduler permits you to automatically back up your workstation (or perform other scheduled actions). See Chapter 7, "Automating tasks", on page 45 for more information about the client scheduler.

Changing your password

Your Tivoli Storage Manager administrator can require you to use a password to connect to the server. Tivoli Storage Manager prompts you for the password if one is required. Contact your Tivoli Storage Manager administrator if you do not know your password.

To change your password from the GUI:

1. From the main window, open the **Utilities** menu and select **Change password**.
2. Enter your current and new passwords, and enter your new password again in the **Verify password** field.
3. Click **Change**.

A Tivoli Storage Manager password can be up to 63 characters. Valid characters are:

Character	Description
A–Z	Any letter; A through Z, upper or lower case
0–9	Any number; 0 through 9
+	Plus
.	Period
_	Underscore
-	Hyphen
&	Ampersand

A password is not case sensitive. See "Password" on page 98 for additional password information.

Sorting file lists

When you select the **View** menu in the menu bar, options are displayed for sorting files by name, directory, date, size, modified date, creation date, backup date, or archive date.

Only one of these options can be in effect at one time. For example, if you select the **Sort by Name** item, a bullet displays at its left. If you select another item, the bullet moves to that item.

Note: When you are viewing a list of files, you can also click the headings above the listing to sort by that particular attribute.

Select the **Edit** menu → **Select Items** or **Deselect Items** options to select or deselect several files simultaneously during a backup or archive operation.

Displaying online help

You can display online help by clicking the question mark (**?**) icon, which displays online information about the current operation.

The help pages may contain HTML style hyper-links to other topics related to the current operation you are performing. You can select a topic of interest in the **Ask** field and search the online help for matches. Search results will be sorted by relevance. Use the left and right arrow keys in the lower right-hand corner to navigate between help pages.

Ending a session

You can end a Tivoli Storage Manager client session in any one of the following ways:

From the GUI:
- Open the **File** menu and select **Quit**.
- Press Command+Q.

Online forum

To participate in user discussions of Tivoli Storage Manager you can subscribe to the ADSM-L list server. This is a user forum maintained by Marist College. While not officially supported by IBM, Tivoli Storage Manager developers and other IBM support staff also participate on an informal, best-effort basis. Because this is not an official IBM support channel, you should contact IBM Technical Support if you require a response specifically from IBM. Otherwise there is no guarantee that IBM will respond to your question on the list server.

You can subscribe by sending a note to the following e-mail address:

```
listserv@vm.marist.edu
```

The body of the message must contain the following:

```
SUBSCRIBE ADSM-L yourfirstname yourlastname
```

The list server will send you a response asking you to confirm the subscription request. Once you confirm your subscription request, the list server will send you further instructions. You will then be able to post messages to the list server by sending e-mail to:

`ADSM-L@vm.marist.edu`

If at a later time you want to unsubscribe from ADSM-L, you can send a note to the following e-mail address:

`listserv@vm.marist.edu`

The body of the message must contain the following:

```
SIGNOFF ADSM-L
```

You can also read and search the ADSM-L archives at the following URL:

`http://www.adsm.org`

Other sources of online help

An anonymous FTP server is available where you can find PTF maintenance and other Tivoli Storage Manager-related materials. Four other anonymous servers are unofficially maintained by non-IBM volunteers. These servers are:

```
ftp.software.ibm.com/storage (primary - IBM)
ftp.rz.uni-karlsruhe.de (mirror - Germany)
ftp.wu-wien.ac.at (mirror - Austria)
ftp.cac.psu.edu (mirror - Pennsylvania)
```

You can get maintenance information from the Tivoli Storage Manager support page at:

```
http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html
```

Also see “Contacting customer support” on page xi for product support information.

Chapter 4. Backing up your data

Use Tivoli Storage Manager to store copies of your workstation files on a Tivoli Storage Manager server. These copies are called backup versions or backups. You can restore these backup versions from the server to your workstation if the original workstation files are lost or damaged. See Chapter 5, “Restoring your data”, on page 33 for more information.

As a quick reference, this chapter includes instructions for the following task.

Task	Page
Performing a backup	31

Attention: *On Macintosh OS X, you must have a system administrator ID and password to perform Tivoli Storage Manager tasks.*

If you are a first-time user, Table 9 is a checklist of preliminary considerations before performing a backup:

Table 9. Preliminary steps for backing up files

___	Decide whether you want to backup files or archive them. See “Do you want to back up or archive files?” for more information.
___	Decide what type of backup you want according to your needs. See the following sections for more information: “Full and partial incremental backup” on page 26, “Incremental-by-date backup” on page 27, and “Comparing full incremental, partial incremental, and incremental-by-date backups” on page 28
___	Create an include-exclude list to specify files and folders you want to exclude from backup services. See “Using the include-exclude list to control processing” on page 28 for more information.
___	For further backup considerations, see “Backup considerations” on page 31

Do you want to back up or archive files?

When the backup-archive client backs up or archives a file, it sends a copy of the file and its associated attributes to the server; however, backups and archives have different goals.

Backups protect against file damage or loss that could occur through accidental deletion, corruption, disk crashes, and so forth. The server maintains one or more backup versions for each file that you back up. Older versions are deleted as newer versions are made. The number of backup versions the server maintains is set by your administrator.

Note: If you need to frequently create archives for the same data, consider using instant archives (backup sets) instead. Frequent archive operations can create a large amount of metadata in the server database increasing database growth and decreasing performance for operations such as expiration. See “Restoring data from a backup set” on page 35 for more information on how backup sets can be generated and restored.

Archive copies are saved for long-term storage. Your administrator can limit how long archive copies are kept. The server can store an unlimited number of archive versions of a file. Archives are useful if you need to go back to a particular version of your files, or you want to delete a file from your workstation and retrieve it at a later time, if necessary. For example, you might need to save spreadsheets for tax purposes, but because you are not using them, you do not want to leave them on your workstation. See Chapter 6, “Archiving and retrieving data”, on page 41 for more information about archiving and retrieving files.

Use backups to protect against unforeseen damage to your files, and use archives for maintaining more permanent versions of your files.

Backing up volumes, folders and files

Your administrator might have set up schedules to back up files on your workstation automatically. See Chapter 7, “Automating tasks”, on page 45 for information on checking and running the schedules available to you. The following sections discuss how to back up files without using a schedule.

Full and partial incremental backup

If you select entire file systems, you are performing a full incremental backup. If you select a directory tree or individual files, you are performing a partial incremental backup.

The first time you run a full incremental backup, Tivoli Storage Manager backs up all the files and folders on the volumes you specify. This process can take a long time if there are a large number of files, or one or more very large files. Subsequent full incremental backups will only back up new and changed files. This allows the backup server to maintain current versions of your workstation files, without having to waste time or space by backing up files that already exist in server storage. Depending on your storage management policies, the server may keep more than one version of your files in storage. The most recently backed up files are active backup versions. Older copies of your backed up files are inactive versions. However, if you delete a file from your workstation, the next full incremental backup will cause the active backup version of the file to become inactive. If you need to restore a file you have deleted, and if a full incremental backup has been run since you deleted the file, then you will need to restore an inactive version of the file (assuming that a version still exists on the server). The number of inactive versions maintained by the server and how long they are retained is governed by the management policies defined by your server administrator. The purpose of the active versions is to represent what files existed on your file system at the time of the backup. See Chapter 8, “Understanding storage management policies”, on page 49 for more information about storage management policies.

To perform a full incremental backup see “Performing a backup” on page 31.

During an incremental backup, the client queries the server to determine the exact state of your files since the last incremental backup. The client uses this information to:

- Back up new files
- Back up files whose contents changed since the last backup. Changes include *any* of the following:
  - File size.

  - Date or time of last modification.
  - Access Control List
  - If *only* the following items change, they are updated without causing the entire file to be backed up to the server:
    - Locked attribute
    - File owner
    - File permissions
    - Last access time
    - User ID
    - Group ID
- Expire backup versions of files on the server that do not have corresponding files on the workstation. The result is that files which no longer exist on your workstation will not have active backup versions on the server.
- Rebind backup versions to management classes if you change management class assignments, even if you do not back up the file.

Attention: Each directory is also backed up if it has not yet been backed up, or if its permissions or time stamp have changed since the last time it was backed up.

Folders are counted in the number of objects backed up. To exclude directories and their contents from backup, use the ***exclude.dir*** option. For more about ***exclude.dir***, see "Exclude options" on page 81.

Understanding which files are backed up

When you request a backup, Tivoli Storage Manager backs up a file if all of the following requirements are met:

- You do not exclude the file from backup in your include-exclude list. If you do not have an include-exclude list, all files will be candidates for backup.
- The selected management class contains a backup copy group. See Chapter 8, "Understanding storage management policies", on page 49 for more information on management classes and backup copy groups.
- The file meets the serialization requirements defined in the backup copy group. If serialization is *static* or *shared static*, and the file changes during backup, the file will not be backed up. See "Using management classes and copy groups" on page 49 for more information.
- The file meets the mode requirements defined in the backup copy group. If the mode is *modified*, the file must have changed since the last backup. If the mode is *absolute*, the file can be backed up even if it does not change. See "Using management classes and copy groups" on page 49 for more information.
- The file meets the frequency requirements defined in the backup copy group. The specified minimum number of days since the last backup must elapse before a file is backed up. Frequency is ignored for partial incremental backups. See "Using management classes and copy groups" on page 49 for more information.

Incremental-by-date backup

For a disk or volume to be eligible for incremental-by-date backups, you must have performed at least one full incremental backup of that entire disk or volume. Running an incremental backup of only a directory branch or individual file will not make the disk or volume eligible for incremental-by-date backups.

To perform an incremental-by-date backup, see "Performing a backup" on page 31.

The client backs up only those files whose modification date and time is later than the date and time of the last incremental backup of the file system on which the file resides. Files added by the client after the last incremental backup, but with a modification date earlier than the last incremental backup, are not backed up. Files that were renamed after the last incremental backup, but otherwise remain unchanged, will not be backed up. Renaming a file does not change the modification date and time. The folders in the path that contain the file are also backed up, unless they already exist on the server. A directory that already exists on the server is only backed up again if its modification timestamp changes. The files under the directory are also backed up even if their modification timestamps have not changed.

If you run an incremental-by-date backup of the whole file system, the server updates the date and time of the last incremental backup. If you perform an incremental-by-date backup on only part of a volume, the server does not update the date of the last full incremental backup. In that case, the next incremental-by-date backup will back up these files again.

Comparing full incremental, partial incremental, and incremental-by-date backups

Full incremental, partial incremental, and incremental-by-date all back up new and changed files. An incremental-by-date backup takes less time to process than a full incremental backup and requires less memory. An incremental-by-date backup might not place exactly the same backup files into server storage because the incremental-by-date backup:

- Does not expire backup versions of files that you delete from the workstation.
- Does not rebind backup versions to a new management class if you change the management class.
- Does not back up files with attributes that change, unless the modification dates and times also change.
- Ignores the copy group frequency attribute of management classes.

Selective backup

Use a selective backup when you want to back up specific files or folders regardless of whether a current copy of those files exists on the server. Incremental backups are generally part of an automated system to back up entire file systems. In contrast, selective backups allow you to manually select a set of files to back up regardless of whether they have changed since your last incremental backup.

To perform a selective backup, see “Performing a backup” on page 31.

Unlike incremental backups, a selective backup:

- Does not cause the server to update the date and time of the last incremental.
- Backs up directory and file entries even if their modification timestamp or permissions have not changed.

Using the include-exclude list to control processing

Usually, there are files that you do not want to back up. These files can be operating system or application files that can be easily recovered by reinstalling the program, or any other file that you could easily rebuild.

Place the ***include*** and ***exclude*** options in the TSM System Preferences file to exclude specific files from backup services. Any file that is not explicitly excluded

is backed up. You do not need to use an ***include*** option to include specific files unless those files are in a folder you are trying to exclude.

Tivoli Storage Manager uses *management classes* to determine how to manage your backups on the server. Every time you back up a file, the file is assigned a management class. The management class is either a default chosen for you, or one you assign to the file using the ***include*** option in the include-exclude list. If you assign a management class it must contain a backup copy group for the file to be backed up. See Chapter 7, “Automating tasks”, on page 45 for more information on management classes and how to assign them to files.

For more information about creating an include-exclude list in your TSM System Preferences file, see “Creating an include-exclude list (optional)” on page 11.

Supported file systems

Tivoli Storage Manager supports HFS, HFS+, UFS, UDF, and ISO 9600 file systems, as defined in Table 10.

Table 10. Supported file systems

File system	Supported platform	Tivoli Storage Manager support
Hierarchical File System (HFS) *and* Hierarchical File System Plus (HFS+)	Macintosh OS X	• Case-insensitive, but case-preserving • Supports creation and modification dates as metadata • Supports aliases • 32 character limit for folders and file names. • Recognized as a local file system.
UNIX File System (UFS)	Macintosh OS X	• UFS is case-sensitive • Supports modification dates as metadata • Supports aliases and symbolic links • 32 character limit for folders and file names • Recognized as a local file system.
Universal Disk Format (UDF)	Macintosh OS X	The Universal Disk Format for DVD volumes. Recognized as removable media.
ISO 9660	Macintosh OS X	The standard format for CD-ROM volumes. Recognized as removable media.

UFS file systems are not supported by applications running in the *Classic* environment on Macintosh OS X.

The UFS file system is sensitive to case whereas the HFS+ file system is case-insensitive but is case-preserving. Files that you back up from a UFS file system (case-sensitive) may not be restored properly to an HFS+ file system (case-insensitive) file system. On a UFS file system, files `Afile` and `afile` are seen as different files. However, on an HFS+ file system the two files are seen as identical.

Aliases and symbolic links are backed up. However, Tivoli Storage Manager does not back up the data the symbolic links point to.

Unicode considerations

The Macintosh OS X client is Unicode enabled. New clients storing data on the server for the first time require no special set up. The server automatically stores files and directories as Unicode enabled. However, if your client already stores data on the server and you upgrade to Unicode-enabled client, you need to plan

for the migration of file spaces to Unicode. For migration information, see "Migrating to the Unicode-enabled client" on page 1.

This involves renaming your file spaces on the server and creating new Unicode-enabled file spaces on the server using the ***autofsrename*** option. For detailed information about this option, see "Autofsrename" on page 67.

Understanding how hard links are handled

When you back up files that are hard-linked, Tivoli Storage Manager backs up each instance of the linked file. For example, if you back up two files that are hard-linked, Tivoli Storage Manager will back up the file data twice.

When you restore hard-linked files, Tivoli Storage Manager attempts to reestablish the links. For example, if you had a hard-linked pair of files, and only one of the hard-linked files is on your workstation, when you restore both files, they will be hard-linked. The one exception to this procedure occurs if you back up two files that are hard-linked and then break the connection between them on your workstation. If you restore the two files from the server, Tivoli Storage Manager will respect the current file system and not restore the hard link.

If you do not back up and restore all files that are hard-linked at the same time, problems will occur. To ensure that hard-linked files remain synchronized, back up all hard links at the same time and restore those same files together.

Maximum file size for backup and restore

Table 11 specifies the maximum file sizes for backup and restore operations.

Table 11. Maximum file size for backup and restore

Platform	Max file size (in bytes)
Macintosh OS X	18,446,744,073,709,551,616 (16EB)

Estimating backup processing time

The first time you perform an incremental backup, Tivoli Storage Manager needs to back up all of your files, which can take a long time. Subsequent backups usually do not take as long. The *Estimate* function is provided on the **Backup** and **Restore** windows to estimate the amount of time it takes to process your files and folders. The estimated transfer is a rough calculation of the time it takes to transfer your data, based on previous transfers of data between your workstation and the current Tivoli Storage Manager server.

The actual transfer time could be longer or shorter than the estimate due to factors like network traffic, system load on your workstation, or system load on the server. The estimate function also does not take into account whether or not files are excluded from backup. The assumption made by the estimation algorithm is that all the files selected will be sent to the server.

Note: Tivoli Storage Manager creates the TSM GUI Preferences file to record statistics from the backup-archive client estimate function. This file is stored in the following locations:

For Macintosh X

Stored in either of the following paths, depending on the Macintosh OS X version you are using:

```
System:Library:Preferences:Tivoli Storage Manager
or
System:Library:PreferencePanes:Tivoli Storage Manager
```

Performing a backup

When you start Tivoli Storage Manager, it sets your default domain to the volumes you set with the ***domain*** option in the TSM System Preferences file (see "Domain" on page 78). If you do not have the domain option set, the default domain is all local volumes. Selecting **Backup Domain** from the **Actions** menu incrementally backs up all volumes in the domain.

You may also exclude volumes in your default domain from backup processing using the Preferences editor.

To run a backup, perform the following steps:

1. Click on the **Backup** button from the GUI main window. The Backup window appears.
2. Expand the folder tree. Select the objects you want to backup. To search or filter files, click on the **Edit** menu→ **Find** item.
3. Select the Type of Backup pull-down menu:
   - To run an incremental backup, click on **Incremental (complete)**
   - To run an incremental backup by date, click on **Incremental (date only)**
   - To run a selective backup, click on **Always backup**
4. To modify specific backup options click the **Options** button. The options you select are effective during the current session *only*.
5. Click on **Backup**. The Task List window displays the backup processing status. The Backup Report window displays processing statistics.

Displaying backup processing status

During a backup, by default Tivoli Storage Manager displays the status of each file it attempts to back up. Tivoli Storage Manager reports the file's size, path, file name, total number of bytes transferred, and whether the backup attempt was successful. These also display in the **TSM Schedule Log** file for scheduled commands.

The backup-archive client GUI provides a **Task List** window that displays information about files during processing. When a task completes, a **Backup Report** window displays processing details.

Backup considerations

This section discusses some advanced considerations for using backup. You do not need to understand this information to use Tivoli Storage Manager for basic work.

How Tivoli Storage Manager maintains volume names

Tivoli Storage Manager backs up volumes based on the volume name. Tivoli Storage Manager maintains each volume name as a separate restore or retrieve volume. These volume names become the names of file spaces on the server.

If you change the name of a volume you have already backed up, Tivoli Storage Manager sees it as a new volume and does not relate it to the previous one. An incremental backup on the volume backs up the files under the new name. A mismatch might occur if you rename your volumes, or if you access Tivoli Storage Manager from a different workstation than the one from which you backed up the files.

Volume naming precautions

Unlike other applications on the Macintosh, Tivoli Storage Manager is not case sensitive—it sees two volumes called “La Pomme” and “la pomme” as identical. Therefore, you must assign a different name to each volume to avoid volume duplications.

If duplicate volumes exist on your desktop, Tivoli Storage Manager cannot determine which one corresponds to the volume of the same name on the server, and displays an error message. Remove or rename duplicates as needed.

Tivoli Storage Manager cannot determine if a network or removable media volume has the same name as a local volume. Do not backup network or removable volumes that have the same name as a local volume. By default, network and removable volumes are not included for backup processing.

Backing up opened files

Some files on your system may be in use, or open, when you try backing them up. Because an open file may change during a backup, the backup may not accurately reflect the contents of the file. If this is the case, you need to consider the following options:

- If the file is unimportant, or can be easily rebuilt (for example, a temporary file), you might not care that the file is not backed up.
- If the file is important:
  - If the backup is not scheduled, close the file and the application before you start the backup.

    If the backup is scheduled, use the ***preschedulecmd*** option to issue a command that closes the file before the backup occurs. For example, if the open file is a database, use the database’s quiesce command to shut down the database. You can use the ***postschedulecmd*** option to restart the application that uses the file after the backup completes.
  - You can back up the file even if it is open and changes during the backup, by assigning the file a management class with the serialization **dynamic** or **shared dynamic**. This is only useful if the file is usable even if it changes during the backup. See “Selecting a management class for files” on page 54 for information on assigning management classes, and “Displaying information about management classes and copy groups” on page 51 for information on determining which management classes are available to you.

File sharing access privileges

Tivoli Storage Manager also backs up File Sharing Access Privileges, but only if *all* backups are done with File Sharing turned on. Also, to restore folders with their previous access privileges, you must perform the restore while File Sharing is on.

Chapter 5. Restoring your data

You can use Tivoli Storage Manager to restore backup versions of specific files, a group of files with similar names, entire folders, or backup sets.

Attention: *On Macintosh OS X, you must have a system administrator ID and password to perform Tivoli Storage Manager tasks.*

This chapter includes instructions for the following tasks.

No query restore

When you select a file space or directory for restore, the client uses a different method for restoring files and directories from the server. This method is called *no query restore* because instead of querying the server for each object to be restored, a single restore request is sent to the server. In this case, the server returns the files and directories to the client without further action by the client. The client merely accepts the data coming from the server and restores it to the destination.

An example of an unrestricted wildcard command would be to select a folder from the restore tree window.

An example of a restricted wildcard command would be to select individual files from a folder.

Standard restore process

The standard restore (also known as classic) process and the no query restore process are outlined below.

1. The client queries the server for a list of files backed up for the client file space you want to restore.
2. The server sends a list of backed up files that match the restore criteria. If you want to restore both active and inactive files, the server sends information about all backed up files to the client.
3. The list of files returned from the server is sorted in client memory to determine the file restore order and to minimize tape mounts required to perform the restore.
4. The client tells the server to restore file data and directory objects.
5. The directories and files you want to restore are sent from the server to the client.

No query restore process

1. The client tells the server that a no query restore is going to be performed and provides the server with details about file spaces, directories, and files.
2. The server sorts the data using an internal sort table which minimizes tape mounts.
3. The data to be restored is sent to the client. File and directory objects stored on disk are sent immediately since sorting for such data is not required before restoring it.
4. You can use multiple sessions to restore the data. If the data resides on multiple tapes, there are multiple mount points available at the server. The combination of using the ***resourceutilization*** option and MAXNUMMP allows multiple sessions. See "Resourceutilization" on page 109 for more information.

If the restore process stops because of a power outage or network failure, the server records the point at which this occurred. This record is known to the client as a *restartable restore*. It is possible to have more than one restartable restore session. Choose **restartable restores** from the Actions menu to find out if your client has any restartable restore sessions in the server database.

You must complete a restartable restore before attempting further backups of the file system. If you attempt to repeat the restore that was interrupted or try to back up the destination file space, the attempt will fail because you did not complete the original restore. From the **Restartable restores** dialog box you can select the interrupted restore and delete it, or you can choose to restart the restore. If you restart the interrupted restore, it will restart with the first transaction, which may consist of one or more files, not completely restored when the interruption occurred. Because of this, you may receive some replace prompts for files from the interrupted transaction which were already restored.

To perform restartable restores using the GUI, follow these steps:
1. Click **Help** from the Restore window.
2. Click **Restoring Backup Versions**
3. Click **Work with restartable restore sessions**.

Do you want to restore an active or inactive backup?

Your administrator determines how many backup versions Tivoli Storage Manager maintains for each file on your workstation. Frequently, the administrator allows more than one version of each file. Having multiple versions of a file allows you to restore older versions in case the most recent backup is damaged, or you need a previous version of the file.

Tivoli Storage Manager considers the most recent backup version to be the *active* version. Any other backup version is considered an *inactive* version.

Every time you back up your files, the new backup version becomes the active version, and the previous active backup version becomes an inactive version. When the maximum number of inactive versions is reached, Tivoli Storage Manager deletes the oldest inactive version.

If you want to restore an inactive backup version, you need to display both active and inactive versions, by clicking on the **View** menu→ **Show active/inactive files** item. To display only the active versions (the default), click on the **View** menu→ **Show active/inactive files** item again.

Performing a restore

To run a restore, perform the following steps:

1. Click on **Restore** from the GUI main window. The Restore window appears.
2. Expand the folder tree. Click on the object that you want to restore. To search or filter files, click on the **Edit** menu→ **Find** item. To perform a point-in-time restore that restores files to the state that existed at a specific date and time, click the **Point-in-Time** button.
3. To modify specific restore options click the **Options** button. The options you select are effective during the current session *only*.
4. Click on **Restore**. The Restore Destination window appears. Enter the appropriate information.
5. Click on **Restore**. The Task List window displays the restore processing status. The Restore Report window displays processing statistics.

Considerations:

- When the client starts up it is running with a UID of zero. This means that if you create a folder to restore your files to, that folder is owned by root. To access the files you must change the permissions of the folder. You can change the folder owner from a terminal window using the **sudo chown** command. Please see your operating system documentation for more information on how to accomplish this.
- When restoring files with the ***replace*** option set to *no*, existing files will not be overwritten, but existing directories will. To leave existing directories intact during a restore operation, select the **Options** button → **All selected files and directories** dropdown menu → **Files only** option.
- When folders are restored from a UFS file system to an HFS file system and they differ only in case, the client will restore the contents of both folders to one folder.

Restoring data from a backup set

Your Tivoli Storage Manager administrator can generate a backup set (a collection of your active files that reside on the server) onto portable media created on a device using a format that is compatible with the client device.

It is possible to generate a backup set as a number of special files if the device class the Tivoli Storage Manager administrator specifies when creating it is *file*. These files can be stored locally (on the client) to provide more restore flexibility.

Portable media can be used on devices such as a CD-ROM, DVD, and Iomega JAZ or ZIP drives. Current device support information is available at the following Web site:

`http://www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html`

You can restore backup sets from the following locations:

- From portable media on a device attached to your client workstation
- Directly from the server

Backup sets can provide you with instant archive and rapid recovery capability as described below:

Instant archive
: This capability allows an administrator to create an archive collection from backup versions already stored on the server.

Rapid recovery
When you are away from your office without a network connection and you lose data, you can restore the data from the backup set.

Note: If you would like to restore a backup set from portable media on a device attached to your client workstation, check with your Tivoli Storage Manager administrator to ensure that the portable media was created on a device using a format that is compatible with your client device.

Restoring an entire or partial backup set

Tivoli Storage Manager considers a backup set as one object containing the whole file structure. You can restore the entire backup set or just select portions. The backup set media is self-describing and contains all the information required to perform a successful restore.

Use the GUI to restore an entire backup set *only*.

Restoring backup sets

Attention: Before you begin a restore, be aware that backup sets can contain data for multiple file spaces. If you specify a destination other than the original location, data from *all* file spaces is restored to the location you specify.

To restore a backup set, perform the following steps:

- Click **Restore** from the GUI main window. The Restore window appears.
- Locate the **Backup Sets** directory tree object and expand it.
  - To restore the backup set from a local device, expand the **Local** object and the Specify backup set location dialog is displayed. On the dialog, select **File name:** or **Tape name:** from the dropdown list and then enter the tape or file name location. You can also click the **Browse** button to open a file selection window and select a backup set.
  - To restore an entire backup set from the server, expand the **Server** object.

  Your backup sets appear in the tree and are grouped by backup set descriptions. Expand a backup set description to see the backup sets with that description.
- Click the selection box next to the backup set that you want to restore.
- Click **Restore**. The Restore Destination window appears. Enter the appropriate information.
- Click on **Restore**. The Task List window displays the restore processing status.

Notes:

1. If the object you want to restore is part of a backup set generated on a node, and the node name is changed on the server, any backup set objects that were generated prior to the name change will not match the new node name. Ensure that the node name is the same as the node for which the backup set was generated.
2. If the backup set is on the server, normal Tivoli Storage Manager security applies, and you can only restore your own files and files to which you have been granted access. However, normal Tivoli Storage Manager security does not apply to backup set data when restored locally because the physical media can be explored by the person who has access to it.
3. To enable the GUI client to restore a backup set on an attached device on a Macintosh standalone workstation, without requiring a server connection, use the ***localbackupset*** option. See “Localbackupset” on page 91 for more

information. Also, certain local devices such as tape devices require device drivers to be set up prior to performing a restore. See the device manual for assistance with this task. You will also need to know the device address in order to perform the restore.

Performing point-in-time restores

Use a *point-in-time* restore to restore files to the state that existed at a specific date and time. A point-in-time restore can eliminate the effect of data corruption by restoring data from a time prior to known corruption, or recover a basic configuration to a prior condition.

You can perform a point-in-time restore of a file space, directory, or file.

Perform incremental backups to support a point-in-time restore. During an incremental backup, the client notifies the server when files are deleted from a client file space or directory. Selective and incremental-by-date backups do not notify the server about deleted files. Run incremental backups at a frequency consistent with possible restore requirements.

If you request a point-in-time restore with a date and time that is prior to the oldest version maintained by the Tivoli Storage Manager server, the object is not restored to your system. Files which were deleted from you workstation prior to the point-in-time specified will not be restored.

Notes:

1. Your administrator must define copy group settings that maintain enough inactive versions of a file to guarantee that you can restore that file to a specific date and time. If enough versions are not maintained, Tivoli Storage Manager may not be able to restore all objects to the point-in-time you specify.
2. If you delete a file or directory, the next time you run an incremental backup, the active backup version becomes inactive and the oldest versions that exceed the number specified by the *versions data deleted* attribute of the management class are deleted. See Chapter 8, “Understanding storage management policies”, on page 49 for more information about the *versions data deleted* attribute.

When performing a point-in-time restore, consider the following:

- Tivoli Storage Manager restores file versions from the most recent backup before the specified point-in-time date. Ensure the point-in-time that you specify is not the same as the date and time this backup was performed.
- If the date and time you specify for the object you are trying to restore is earlier than the oldest version that exists on the server, Tivoli Storage Manager cannot restore that object.
- Point-in-time restore will restore files deleted from the client workstation after the point-in-time date but not files deleted before this date.
- Tivoli Storage Manager cannot restore a file created after the point-in-time date and time. When a point-in-time restore runs, files that were created on the client after the point-in-time date are not deleted.

To perform a point-in-time restore using the client GUI, use the following steps:

1. Click the **Restore** button in the main window. The Restore window appears.
2. Click the **Point-in-Time** button from the Restore window. The Point in Time Restore window appears.

3. Select the **Use a Point-in-Time Date** selection box. Select the date and time and click **OK**. The point in time that you specified appears in the Point in Time display field in the Restore window.
4. Display the objects you want to restore. You can search for an object by name, filter the directory tree, or work with the directories in the directory tree.
5. Click the selection boxes next to the objects you want to restore.
6. Click the **Restore** button. The Restore Destination window displays. Enter the appropriate information.
7. Click the **Restore** button to start the restore. The Restore Task List window displays the restore processing status.

Note: If there are no backup versions of a directory for the point-in-time you specify, files within that directory are not restoreable from the GUI.

Related tasks and considerations

This section discusses some advanced considerations for restoring files. You do not need to understand this information to perform basic Tivoli Storage Manager tasks.

Authorizing another user to restore or retrieve your files

You can authorize a user on another node to restore your backup versions or retrieve your archive copies. This allows you to share files with other people or with other workstations that you use with a different Tivoli Storage Manager node name.

To authorize another node to restore or retrieve your files:

1. From theTivoli Storage Manager main window select the **Utilities** menu → **User Access List** item. The User Access List window displays.
2. Enter the node name of the user you want to authorize, and the directory and file name to which you want the user to have access. You can give the user access to backups or archives. You must add separate authorizations for backup and archive access, even if you want to give the same node access to the same files for both. You can authorize all users by using an asterisk (*) for the node name.
3. Click on **Add** to add the node. While you are in the User Access List window, you can add several nodes at once, delete nodes, or change your existing authorizations. All additions, deletions, and changes are processed when you click on **OK**. If you make a mistake, click on **Cancel** to exit the user access list and start again.
4. Click on **OK** to add the node to the user access list.

Restoring or retrieving another user's files

After users grant you access to their files on the server, you can restore or retrieve those files to your local system. You can display another user's file spaces on the Tivoli Storage Manager server, restore the other user's backup versions, or retrieve the other user's archive copies to your local drives.

1. From the Tivoli Storage Manager main window select the **Utilities** menu→ **Access Another User** item. The Access Another User window displays.
2. Enter the user's node name in the Node name field.
3. Click on **Set**.

Restoring or retrieving your files to another workstation

Tivoli Storage Manager lets you restore or retrieve files you back up from your own workstation, when you are using a different workstation. You just need to specify your node name, because your backups and archives are stored according to your node, not your specific machine. Your Tivoli Storage Manager password protects your data.

To restore or retrieve files to another workstation, either change the ***nodename*** option in your TSM System Preferences file to match the current workstation, or type it in when prompted for the nodename and password. You can then restore or retrieve files as if you were working on your original workstation.

If you do not want to restore or retrieve the files to the same folder name on the alternate workstation, use a different destination.

You can have only one TSM System Preferences file containing one or more server stanzas. Each server stanza can have a ***nodename*** option. See "Nodename" on page 96 for more information.

Restoring a disk in case of disk loss

Tivoli Storage Manager can only recover your files if you can run the client. If the disk that contains the client is lost (from theft or hardware failure, for example), you must reinstall the client before you can recover your files. If you also lose the disk that contains the operating system and communication software, you must recover them before you can connect to the Tivoli Storage Manager server.

To protect yourself against these kinds of losses, perform the following steps:

1. Record the IP address, subnet mask, default router, and name servers in the TCP/IP Control Panel. You can use this information to reconfigure TCP/IP when you re-install MacOS.
2. Record your nodename, TCP Server address, and TCP Port number from the **Communications** panel of the Preferences editor. The nodename information comes from the **General** panel in the Preferences editor. You will need this information to configure Tivoli Storage Manager so you can restore your data.
3. Re-install the MacOS from your Macintosh installation CD to access the network.
4. Install the Tivoli Storage Manager for Macintosh installation program. You can either get this from the following Web site:

   `www.ibm.com/software/sysmgmt/products/support/IBMTivoliStorageManager.html`

Deleting restore or retrieve volumes

If your Tivoli Storage Manager administrator gives you backdelete and archivedelete authority, you can delete entire restore/retrieve volumes from storage. This deletes all the files, both backup versions and archive copies, that are associated with a particular volume. You can select the **File** menu→ **Connection Information** item to see your permissions.

For example, if you delete the **Macintosh HD** restore/retrieve volume, you are deleting all associated backup versions and archive copies. The original files still exist on your hard disk. Consider this carefully before you delete a restore or retrieve volume. You cannot delete individual backup versions kept on the server.

If you decide you do not need a restore/retrieve volume, delete it by clicking on the **Utilities** menu→ **Delete Filespaces**.

Note: Restore and Retrieve volumes can also be referred to as file spaces.

Overlapping files

Tivoli Storage Manager remembers a file's position on your desktop when it backs up the file and tries to restore it back to its original position. If a file is in the top, left corner of your desktop when you back it up, Tivoli Storage Manager tries to put it there when you restore it.

But if something else is in that same position when you restore, it is possible that folders and icons can overlap. If this occurs, select the **View** menu→ **View Options** item → **by Name** item, to list objects alphabetically, with no overlapping.

Rebuilding the desktop

If a file you restore does not have the icon it should, you probably need to rebuild the Desktop. Folders with icons pasted onto the Get Info dialog box always require the Desktop to be rebuilt. Do this by restarting your Macintosh with the **Option** and **Command** keys held down.

Chapter 6. Archiving and retrieving data

Archiving and retrieving files is similar to backing up and restoring them; many of the windows and concepts are the same. See Chapter 4, “Backing up your data”, on page 25 for more information. See “Do you want to back up or archive files?” on page 25 for a discussion of the differences between backups and archives.

As a quick reference, this chapter includes instructions for the following tasks:

Attention: *On Macintosh OS X, you must have a system administrator ID and password to perform Tivoli Storage Manager tasks.*

Archiving files

Your administrator might have set up schedules to automatically archive certain files on your workstation. See Chapter 7, “Automating tasks”, on page 45 for information on checking and running the schedules available to you. The following sections discuss how to archive files without using a schedule.

Maximum file size for archive and retrieve operations

Table 12 specifies the maximum file sizes for archive and retrieve operations.

Table 12. Maximum file size for archive and retrieve

Platform	Max file size (in bytes)
Macintosh OS X	18,446,744,073,709,551,616 (16EB)

Understanding how hardlinks are handled

When you archive files that are hard-linked, Tivoli Storage Manager archives each instance of the linked file. For example, if you archive two files that are hard-linked, Tivoli Storage Manager will archive the file data twice.

When you retrieve hard-linked files, Tivoli Storage Manager attempts to reestablish the links. For example, if you had a hard-linked pair of files, and only one of the hard-linked files is on your workstation, when you retrieve both files, they will be hard-linked. The one exception to this procedure occurs if you back up two files that are hard-linked and then break the connection between them on your workstation. If you retrieve the two files from the server, Tivoli Storage Manager will respect the current file system and not retrieve the hard link.

If you do not archive and retrieve all files that are hard-linked at the same time, problems will occur. To ensure that hard-linked files remain synchronized, archive all hard links at the same time and retrieve those same files together.

Understanding how your archives are managed

As with backing up files, Tivoli Storage Manager checks the ***include*** options in your include-exclude list to determine which management class to assign to your archived files. If you do not specifically assign a management class to a file with an ***include*** option, Tivoli Storage Manager assigns the file the default management class.

Tivoli Storage Manager can only archive a file if the selected management class contains an archive copy group.

For information on the various management class attributes used to manage your archives, see "Displaying information about management classes and copy groups" on page 51. For information on assigning management classes, see "Assigning a management class to files" on page 54.

Estimating archive processing time

An **Estimate** function is provided on the **Archive** and **Retrieve** windows. Use this function if you want to estimate the amount of time it takes to process your files and folders. The estimated transfer is a rough calculation of the time it takes to transfer your data. It is based on previous transfers of data between your workstation and the current Tivoli Storage Manager server. The actual transfer time can differ from the estimate due to network traffic, system load on your workstation, or system load on the server.

Performing an archive

You can use Tivoli Storage Manager to archive specific files, a group of files with similar names, or entire folders. You can locate the files you want to archive by searching or filtering. Filtering displays only the files that match the filter criteria for your archive operation.

To perform an archive, do the following:

1. Click on **Archive** from the GUI main window. The **Archive** window appears.
2. Expand the folder tree. Click on the object you want to archive. To search or filter files, click on the **Edit** menu→ **Find** item.
3. In the Description field, do one of the following:
   - Enter a description. The maximum length of a description is 254 characters.
   - Accept the default description
   - Select an existing description from the drop-down list.
4. To modify specific archive options click the **Options** button. The options you select are effective during the current session *only*.
5. Click on **Archive**. The Task List window displays the archive processing status. The Archive Report window displays processing statistics.

Displaying archive status

During an archive operation the **Task List** window to display statistics on various items, and to notify you when your archive completes. The **Task List** window does not appear during scheduled archives.

Transfer statistics, such as bytes transferred, may not match the file statistics, such as file size, if the archive or retrieve command is retried due to a communications failure or session loss. The transfer statistics will show the bytes attempted to be transferred across all command attempts.

Deleting archived files

You can delete archives if you decide you no longer need them. Unlike backup versions, you can delete individual archives without deleting the entire restore/retrieve volume.

To delete an archive copy:

1. Click on **Utilities** from the GUI main window and click on **Delete Archive Data**. The Archive Delete window appears.
2. Expand the folder tree. The folder tree contains groups of files identified by a description and archived to the server.
3. Click on the selection boxes next to the archives you want to delete.
4. Click on **Delete**. The Archive Delete Status window displays the archive deletion processing status.

Retrieving archives

Many of the advanced considerations for retrieving files are the same as they are for restoring files. See these sections for more information:

- "Authorizing another user to restore or retrieve your files" on page 38
- "Restoring or retrieving another user's files" on page 38
- "Restoring or retrieving your files to another workstation" on page 39

Performing a retrieve

Retrieve a file when you want to return an archive copy from the server to your workstation. To retrieve an archived file using the GUI:

1. Click on **Retrieve** from the GUI main window. The Retrieve window appears.
2. Expand the folder tree. Select the object you want to retrieve. To search or filter files, click on the **Edit** menu→ **Find** item.
3. To modify specific retrieve options click the **Options** button. The options you select are effective during the current session *only*.
4. Click the **Retrieve** button. The Retrieve Destination window appears. Enter the appropriate information.
5. Click on **Retrieve**. The **Task List** window displays the retrieve processing status. The Retrieve Report window displays processing statistics.

Considerations:

- When the client starts up it is running with a UID of zero. This means that if you create a folder to retrieve your files to, that folder is owned by root. To access the files you must change the permissions of the folder. You can change the folder owner from a terminal window using the **sudo chown** command. Please see your operating system documentation for more information on how to accomplish this.
- When retrieving files with the ***replace*** option set to *no*, existing files will not be overwritten, but existing directories will. To leave existing directories intact during a retrieve operation, select the **Options** button → **All selected files and directories** dropdown menu → **Files only** option.
- When folders are retrieved from a UFS file system to an HFS file system and they differ only in case, the client will retrieve the contents of both folders to one folder.

Chapter 7. Automating tasks

Your administrator can schedule Tivoli Storage Manager to perform tasks automatically. For example, you can automatically back up files at the end of each day or archive some of your files every Friday. This procedure, known as *central scheduling*, is a cooperative effort between the server and your client node. Your administrator associates clients with one or more schedules that are part of the policy domain maintained in the server database. The administrator defines central scheduling on the server and you start the client scheduler on your workstation. Once you start the client scheduler, further intervention is not necessary.

With client scheduling, you can also:
- Display information about available schedules.
- Display information about work that the schedule has completed.
- Modify scheduling options in the preferences file.

Specifying scheduling options

You can modify scheduling options in the TSM System Preferences or in the Preference editor. However, if your administrator specifies a value for these options, that value overrides what you have in the client Preferences file.

For more information about scheduling options, changing the scheduling mode, or specifying the TCP/IP address or port number, see “Scheduling options” on page 63.

Starting the client scheduler

You can run scheduling services in either the *daemon mode* or the *standalone mode*. The daemon mode permits two programs to work together to provide the scheduling service, while the standalone mode uses only the Scheduler program.

Starting in daemon mode

The scheduler daemon, a background application that operates in sleep mode until it is time to run a schedule, starts the Scheduler program. The Scheduler program then queries the server for the next schedule to run and performs the scheduled action, such as a backup or restore, at the scheduled time. Using the scheduler daemon during sleep mode requires very little memory.

To start the scheduler in daemon mode, follow these steps:
For Macintosh OS X:

1. Open the Login Preferences Panel.
2. Drag and drop the **TSM Mac X Schedule Deamon** into the Login Items window.

Depending upon when your administrator has set your schedules to run, the scheduler might run while you work. Clicking on another running application places the scheduler in the background.

To stop the scheduler daemon or prevent it from starting after login, follow these steps:
For Macintosh OS X:

1. Use the **Force Quit** command to stop the scheduler daemon.
2. To prevent the daemon from starting after login, remove the item from your Login Preferences Panel.

Starting in standalone mode

When using the scheduler in standalone mode, it continues to run until you stop it. This provides more control but requires more memory.

To use the standalone mode, follow these steps:
For Macintosh OS X:

1. Open the Login Preferences Panel.
2. Drag and drop the **TSM Mac X Schedule** into the Login Items window.

Notes:

1. You can also double-click the Scheduler icon, but it will not start up automatically the next time you restart your workstation.
2. When the scheduler starts, the following message is added to the TSM Schedule Log:

   ```
   The Scheduler is under the control of the TSM Scheduler Daemon.
   ```

   The daemon and the scheduler use a temporary file called TSMTimer.txt. On Mac OS X, this file resides in the /private/tmp/0/Temporary Items directory. If the scheduler is started in standalone mode and this file exists, the scheduler will not work as expected. If the temporary file exists and the daemon is not being used, remove the TSMTimer.txt file. You cannot use the scheduler in the standalone mode and daemon mode at the same time.

The scheduler runs in the background. When you bring it to the foreground, the Scheduler window displays either the amount of time remaining before the schedule runs or the status of a backup or archive process. To quit the scheduler, select **Quit** from the File menu.

Displaying information about completed work

After scheduled work is performed, check the schedule log to verify that all work completed successfully. The schedule log continues to grow unless you prune it using the ***schedlogretention*** option. See “Specifying scheduling options” on page 45 for more information.

Understanding the scheduler log

The scheduler log file provides information about which schedule runs next and which files are processed. The default file name, **TSM Scheduler Log**, is created in the application folder. Use the ***schedlogname*** option to change the location and name of this file.

The schedule log continues to grow in size unless you prune it with the ***schedlogretention*** option.

When the scheduler queries the server for the next schedule, it sends the schedule information to the log file. The following information is logged:

Table 13. Schedule log information

Category	Description
Schedule name	Specifies the name the administrator assigns to the schedule.
Action	Specifies the type of task to perform on the files listed in the Objects field: • Incremental. Incrementally backs up the files. • Selective. Backs up the files. • Archive. Archives the files. • Restore. Restores the files. • Retrieve. Retrieves the files. • Command. Runs the command shown in the Objects field.
Objects	Names the volumes or files to process. If this field is empty for an incremental backup, then the default domain is used.
Options	Overrides options that you set for scheduling in your Preferences file. See “Specifying scheduling options” on page 45 for more information about scheduling options.
Server window start	Specifies the date and time when the next schedule will run. If the server uses randomization for schedules, the schedule then runs *after* the specified time.

Output from scheduled commands is sent to the log file. After scheduled work is performed, check the log to ensure the work completed successfully.

When a scheduled command is processed the schedule log contains the following entry:

```
Scheduled event eventname completed successfully
```

This is merely an indication that Tivoli Storage Manager successfully issued the scheduled command associated with the *eventname*. No attempt is made to determine the success or failure of the command. You should assess the success or failure of the command by evaluating the return code from the scheduled command in the schedule log. The schedule log entry for the command’s return code is prefaced with the following text:

```
Finished command. Return code is:
```

You can modify the scheduling options in your Preferences file if you do not like the current values. For more information about scheduling options, see “Scheduling options” on page 63.

Chapter 8. Understanding storage management policies

Storage management policies are rules your administrator defines in order to manage your backups and archives on the server. You can associate (or *bind*) your data to these policies; then when the data is backed up or archived, it is managed according to policy criteria. Policy criteria include a policy domain, a policy set, a copy group, and a management class.

Policies determine:
- Whether a file is eligible for backup or archive services.
- How many backup versions to keep.
- How long to keep inactive backup versions and archive copies.
- Where to place the copies in storage.
- For incremental backup, policies also determine:
  - How frequently a file can be backed up.
  - Whether a file must change before it is backed up again.

This chapter explains:
- Policy criteria (policy domains, policy sets, copy groups, and management classes).
- How to display policies.
- How Tivoli Storage Manager associates your data with policies.

Using policy domains and policy sets

A *policy domain* is a group of clients with similar requirements for backing up and archiving data. Policy domains contain one or more policy sets. An administrator uses policy domains to manage a group of client nodes in a logical way. For example, a policy domain might include:
- A department, such as Accounting.
- A physical location, such as a particular building or floor.
- A local area network, such as all clients associated with a particular file server.

Tivoli Storage Manager includes a default policy domain named *Standard*. At first, your client node might be associated with the default policy domain. However, your administrator can define additional policy domains if there are groups of users with unique backup and archive requirements.

A *policy set* is a group of one or more management classes. Each policy domain can hold many policy sets. The administrator uses a policy set to implement different management classes based on business and user needs. Only one of these policy sets can be active at a time. This is called the *active policy set*. Each policy set contains a *default management class* and any number of additional management classes.

Using management classes and copy groups

A *management class* is a collection of backup and archive copy groups that establishes and contains specific storage management requirements for backing up and archiving data. An administrator can establish separate management classes to meet the backup and archive requirements for different kinds of data, such as:
- System data that is critical for the business.

- Application data that changes frequently.
- Report data that Management reviews monthly.
- Legal information that must be retained indefinitely, requiring a large amount of disk space.

Most of the work you do with storage management policies is with management classes. You must associate (or *bind*) each file and folder that you back up and each file that you archive with a management class. If you do not associate a file with a management class, Tivoli Storage Manager uses the default management class in the active policy set. If you do not specify a management class for folders, Tivoli Storage Manager uses the management class in the active policy set with the largest *retain only* setting.

You can use ***include*** statements in your include-exclude list to associate files with management classes. See "Selecting a management class for files" on page 54 for more information. In your Preferences file, you can associate folders with a management class, using the ***dirmc*** option. See "Selecting a management class for folders" on page 55 for more information.

Within a management class, the specific backup and archive requirements are in *copy groups*. Copy groups define the specific storage management attributes that describe how the server manages backed up or archived data. Copy groups include both *backup copy groups* and *archive copy groups*. A management class can have one backup copy group, one archive copy group, both, or neither.

A *backup copy group* contains attributes that are used during the backup process to determine:
- Whether a file that has changed since the last backup is backed up again.
- How many days must elapse before a file is backed up again.
- How a file is processed during a backup if it is in use.

It also contains attributes to manage the backup versions of your files on the server. These attributes control:
- Where the server stores backup versions of your files and folders.
- How many backup versions the server keeps of your files and folders.
- How long the server keeps backup versions of your files and folders.
- How long the server keeps inactive backup versions.
- How long the last version of a file is kept.

An *archive copy group* contains attributes that control:
- Whether a file is archived if it is in use
- Where the server stores archived copies of your files
- How long the server keeps archived copies of your files

When the server is unable to rebind a file to an appropriate management class, the server uses one of two values to determine the number of days to retain the file. If it is a backup version, the server uses ***backup grace period retention***. If it is an archive copy, the server uses ***archive grace period retention***. For more information about grace periods, see "Using a retention grace period" on page 56.

Displaying information about management classes and copy groups

Before you select the management classes you want to use, click **View policy information** from the Utilities menu. The **Policy Information** window is displayed. You can then determine which management classes are available.

The **Display policy information** window provides the following information:

- The name of the default management class.
- The name of the policy domain to which the management class belongs.
- The policy set that is currently active.
- The date and time that this policy set became active.
- The number of backup versions which are maintained for files which still exist on your workstation.
- The number of backup versions which are maintained for files which have been deleted from your workstation.
- The number of days to keep inactive backup versions.
- The number of days to keep the last backup version.
- The management class name and a description.

Table 14 shows the default values for the backup and archive copy groups in the standard management class. Each attribute is discussed in more detail immediately following the table.

Table 14. Default values in the standard management class

Attribute	Backup default	Archive default
Copy group name	Standard	Standard
Copy type	Backup	Archive
Copy frequency	0 days	CMD (Command)
Versions data exists	Two versions	Does not apply
Versions data deleted	One version	Does not apply
Retain extra versions	30 days	Does not apply
Retain only version	60 days	Does not apply
Copy serialization	Shared static	Shared static
Copy mode	Modified	Absolute
Copy destination	Backuppool	Archivepool
Retain versions	Does not apply	365 days

Copy group name

The name of the copy group. The default value for both backup and archive is *Standard.*

Copy type

The type of copy group. The value for backup is always *Backup,* and the value for archive is always *Archive.*

Copy frequency

Copy frequency is the minimum number of days that must elapse between successive incremental backups. Use this attribute during a full incremental backup.

Copy frequency works with the *mode* parameter. For example, if frequency is *zero (0)* and mode is *modified*, a file or folder is backed up *only if* it changed since the last incremental backup. If frequency is *zero (0)* and mode is *absolute*, a file is backed up every time you run an incremental backup against it. This attribute is not checked for selective backups.

For archive copy groups, copy frequency is always CMD (command). There is no restriction on how often you archive a file.

Versions data exists

The *Versions Data Exists* attribute specifies the maximum number of different backup versions retained for files and folders currently on your volume. If you select a management class that permits more than one backup version, the most recent version is called the *active* version. All other versions are called *inactive* versions. If the maximum number of versions permitted is five, and you run a backup that creates a sixth version, the oldest version is deleted from server storage.

Versions data deleted

The *Versions Data Deleted* attribute specifies the maximum number of different backup versions retained for files and folders that you erased from your volume. This parameter is ignored as long as the file or folder remains on your volume.

If you erase the file or folder, the next time you run an incremental backup, the active backup version is changed to inactive and the oldest versions are erased that exceed the number specified by this parameter.

The expiration date for the remaining versions is based on the *retain extra versions* and *retain only version* parameters.

Retain extra versions

The *Retain Extra Versions* attribute specifies how many days all but the most recent backup version is retained. The most recent version is the active version, and active versions are never erased. If *Nolimit* is specified, then extra versions are kept until the number of backup versions exceeds the *versions data exists* or *versions data deleted* parameter settings. In this case, the oldest extra version is deleted immediately.

Retain only version

The *Retain Only Version* attribute specifies the number of days the last remaining inactive version of a file or folder is retained. If *Nolimit* is specified, the last version is retained indefinitely.

This parameter goes into effect during the next incremental backup after a file is deleted from the client machine. Any subsequent updates to this parameter will not affect files that are already inactive. For example: If this parameter is set to 10 days when a file is inactivated during an incremental backup, the file will be expired in 10 days.

Copy serialization

The *Copy Serialization* attribute determines whether a file can be in use during a backup or archive, and what to do if it is. The value for this attribute can be one of the following:

- **Static**. A file or folder must not be modified during a backup or archive. If the object is changed during a backup or archive attempt, it is not backed up or archived.
- **Shared static**. A file or folder must not be modified during backup or archive. Tivoli Storage Manager attempts to perform a backup or archive as many as four additional times, depending on the value specified on the ***changingretries*** option in your Preferences file. If the object is changed during every backup or archive attempt, it is not backed up or archived.
- **Dynamic**. A file or folder is backed up or archived on the first attempt regardless of whether it changes during a backup or archive.
- **Shared dynamic**. A file or folder is backed up or archived regardless of whether it changes during a backup or archive. Tivoli Storage Manager attempts to perform a back up or archive as many as four additional times, depending on the value specified on the ***changingretries*** option in your Preferences file without the file changing during the attempt. The file is backed up or archived on the last try even if it has changed.

  Attention: Be careful when you select a management class containing a copy group that specifies shared dynamic or dynamic for serialization backup. If you select a management class that permits a file to be backed up or archived while it is in use, the backup version or archived copy stored on the server might be a fuzzy copy. A *fuzzy copy* is a backup version or archived copy that does not accurately reflect what is currently in the file. It might contain some, but not all, of the changes. If that is not acceptable, select a management class that creates a backup version or archive copy only if the file does not change during a backup or archive.

  If you restore or retrieve a file that contains a fuzzy copy, the file might not be usable. You should not use dynamic or shared dymamic serialization to back up files, unless you are absolutely certain that a restore of a fuzzy copy will be usable.

Copy mode

The *Copy Mode* attribute determines whether a file or folder is considered for incremental backup regardless of whether it changed or not since the last backup. Tivoli Storage Manager does not check the mode for selective backups. The value for this parameter can be one of the following:

- **Modified.**The file is considered for incremental backup *only if* it has changed since the last backup. A file is considered changed if any of the following are true:
  - The date or time of the last modification is different.
  - The file size is different.
  - The file attributes, with the exception of archive, are different. However, if only the file meta-data changes (such as access permissions), but the file data does not change, Tivoli Storage Manager may back up only the meta-data.
- **Absolute.** The file is considered for incremental backup regardless of whether it changed since the last backup. For archive copy groups, the mode is always *absolute,* indicating that a file is archived regardless of whether it changed since the last archive request.

Copy destination

Names the destination where backups or archives are stored. The destination can be either a storage pool of disk devices or a storage pool of devices that support removable media, such as tape.

Retain versions

Specifies the number of days an archived file remains in storage. When the specified number of days elapse for an archived copy of a file, it is deleted from server storage.

Selecting a management class for files

If the default management class meets the backup and archive requirements for all the files on your workstation, it is not necessary to take any action to associate your files with that management class. This is done automatically when you back up or archive your files.

When selecting a different management class for your files, consider these questions:

- Does the management class contain a backup copy group?

  If you attempt to back up a file associated with a management class that does not contain a backup copy group, the file is not backed up.
- Does the management class contain an archive copy group?

  You cannot archive a file associated with a management class that does not contain an archive copy group.
- Does the backup copy group contain attributes that back up your files often enough?

  Mode and frequency work together to control how often a file is backed up when you use incremental backup. Tivoli Storage Manager does not check those attributes for selective backup.
- Do the copy groups specify either static or shared static for serialization?

  If serialization is shared dynamic or dynamic, you might get fuzzy backups or archive copies. Verify that this is acceptable. For example, you might want to use shared dynamic or dynamic serialization for a file to which log records are continuously added. If you used static or shared static serialization, the file might never back up because it is constantly in use. With shared dynamic or dynamic serialization, the file is backed up, but the backup version of the file might contain a truncated message. Do not use shared dynamic or dynamic serialization for a file if it is very important that the backup version or archive copy contain all changes.
- Does the backup copy group specify an adequate number of backup versions to keep, along with an adequate length of time to keep them?
- Does the archive copy group specify an adequate length of time to keep archived copies of files?

Assigning a management class to files

A management class defines when your files are included in a backup, how long they are kept on the server, and how many versions of the file the server should keep. The server administrator selects a default management class. You can specify your own management class to override the default management class.

You can assign a management class for a file or file group by using an **include** statement in your Preferences file. Management class names are not case-sensitive. For example, to associate all the files in the costs folder with a management class named **budget**, enter:

```
include"...:Costs:*" budget
```

To specify a management class named **managall** to use for all files to which you do not explicitly assign a management class, enter:

```
include * managall
```

The example below demonstrates how to use a management class:

```
exclude "...:...:*sno"
include "la pomme:winter:...:*Ice"      mcweekly
include "la pomme:winter:december:*Ice" mcdaily
include "la pomme:winter:january:*Ice"  mcmonthly
include "la pomme:winter:winter:white sno"
```

Processing follows these steps:

1. The file named white sno is backed up following bottom-up processing rules. Because you did not specify a management class, the file is assigned to the default management class.
2. Any file with an extension of ice in the la pomme:winter:january folder is assigned to the management class, ***mcmonthly***.
3. Any file with an extension of ice in the la pomme:winter:december folder is assigned to the management class, ***mcdaily***.
4. Any other files with an extension of ice in any directory under la pomme:winter:december are assigned to the management class, ***mcweekly***.
5. Any file with an extension of sno (except la pomme:winter:winter:white sno) in any directory is excluded from backup.

To specify your own default management class for files that are not explicitly included, specify:

```
include "...:*" mgmt_class_name
```

as the first include or exclude option defined.

Overriding the management class for archived files

When you archive a file, you can override the assigned management class using the graphical user interface (GUI). To use the GUI, press the **Options** button on the archive tree and select a different management class.

Selecting a management class for folders

If the management class in your active policy set containing the longest retention period meets your backup requirements for folders, it is not necessary to associate folders with that management class. Tivoli Storage Manager does it automatically when it backs up your folders.

If the default management class does not meet your requirements, select a management class with an adequate retention period specified on the *retain only version* parameter. You should keep folders at least as long as you keep the files associated with those folders.

Assigning a management class to folders

To assign a management class other than the default to folders, use the ***dirmc*** option in your Preferences file. For example, to assign a management class named **folder1** to your folders, you would enter:

```
dirmc folder1
```

Binding and rebinding management classes to files

Binding associates a file with a management class. When you back up a file for the first time, Tivoli Storage Manager binds it to either the default management class or the management class specified in your include-exclude list. In later full incremental backups of the same file, if you change the management class, both active and inactive versions are bound again to the new management class. However, with selective backup and incremental-by-date backups, the new backups are bound to the new management class, but previous backup versions remain bound to the original management class.

If the backup copy group for the management class specifies keeping multiple backup versions of the file, and you request multiple backups, the server always has one active backup version (the current version) and one or more inactive backup versions of the file. All backup versions of a file are bound to the same management class and are managed based on the attributes in the backup copy group.

When you archive a file for the first time, Tivoli Storage Manager binds it to the default management class, to the management class specified in your include-exclude list, or to a management class you specify when modifying your archive options during an archive.

Archived files are never rebound to a different management class. If you change the management class for a file, any previous copies of the file that you archived remain bound to the management class specified when you archived them.

Rebinding backup versions of files

Backups of files are bound again to a different management class in the following conditions. In each condition, the files (active and inactive) are not bound again until the next backup.

- You specify a different management class in an Include statement to change the management class for the file. The backups are managed based on the old management class until you run another backup.
- Your administrator deletes the management class from your active policy set. The default management class is used to manage the backup versions when you back up the file again.
- Your administrator assigns your client node to a different policy domain and the active policy set in that domain does not have a management class with the same name. The default management class for the new policy domain is used to manage the backup versions.

Using a retention grace period

Tivoli Storage Manager also provides a *backup retention grace period* and an *archive retention grace period* to help protect your backup and archive data when it is unable to rebind a file to an appropriate management class. The backup retention grace period is used when:

- You change the management class for a file, but neither the default management class nor the new management class contain a backup copy group.
- The management class to which a file is bound no longer exists, and the default management class does not contain a backup copy group.

The backup retention grace period, defined in your policy domain, starts when you run an incremental backup. The default is 30 days. However, your administrator can lengthen or shorten this period.

When Tivoli Storage Manager manages a file using the backup retention grace period, it does not create any new backup versions of the file. All existing backup versions of the file expire 30 days (or the number of days specified in your policy domain) from the day they are marked inactive.

For archived files, if the management class to which a file is bound no longer exists, and the default management class does not contain an archive copy group, the archive retention grace period defined in your policy domain is used. The default retention period is 60 days. However, your administrator can lengthen or shorten this period.

Chapter 9. Using processing options

You can use defaults for processing options or you can tailor the processing options to meet your specific needs. This chapter:
- Provides an overview of processing options.
- Includes an options reference section that provides detailed information about each option.

Overview of processing options

Tivoli Storage Manager uses *processing options* that you specify in your TSM System Preferences or TSM User Preferences to control communications, backup-archive processing, and other types of processing.

This section provides an overview of the following types of options that you can use:
- Communication options
- Server and Node options
- Backup and archive processing options
- Restore and retrieve processing options
- Scheduling options
- Format and language options
- Authorization options
- Error processing options
- Transaction processing option

See Chapter 2, “Configuring Tivoli Storage Manager”, on page 7 for information on how to create and modify your TSM System Preferences or TSM User Preferences file.

Tivoli Storage Manager processes options in the following order (precedence):
1. Options defined on the server with server-enforced client options. The server overrides client values.
2. Options defined on the server for a schedule using the options parameters.
3. Options entered locally in the options file.
4. Options received from the server with client options not enforced by the server. The server *does not* override client values.
5. Default option values.

Communication options

You use communication options to specify how your client node communicates with a Tivoli Storage Manager server.

Macintosh only supports the TCP/IP communication protocol. Use the ***commmethod*** option to specify the TCP/IP communication protocol. For more information, see “Commmethod” on page 70.

Ask your Tivoli Storage Manager administrator for assistance in setting your communication options.

TCP/IP options

To use the TCP/IP communication protocol, you must include the ***tcpserveraddress*** option in your TSM System Preferences file. The other TCP/IP options have default values which you can modify only if you want to change the default value.

Table 15. TCP/IP options

Option	Description	Page
tcpbuffsize	Specifies the size, in kilobytes, of the Tivoli Storage Manager internal TCP/IP communication buffer.	119
tcpport	Specifies the TCP/IP port address for a Tivoli Storage Manager server.	120
tcpserveraddress	Specifies the TCP/IP address for a Tivoli Storage Manager server.	121
tcpwindowsize	Specifies the size, in kilobytes, of the TCP/IP sliding window for your client node.	122

Server and Node options

Use the following options to specify the server to contact for backup-archive services, and the client node for which to request backup-archive services.

Server options

Use the ***servername*** option in your TSM System Preferences file to begin a group of options (stanza) used to connect to a Tivoli Storage Manager server. You can set up multiple stanzas in the TSM System Preferences file to connect to different servers. Each stanza must contain all options required to establish communication with a server. The stanza can also contain other options for backup-archive operations.

If your TSM System Preferences file contains only one stanza - Your client node contacts the server you specify in that stanza for all services.

If your TSM System Preferences file contains more than one stanza - You can specify a default server with the ***defaultserver*** option. If you do not specify a default server, by default Tivoli Storage Manager contacts the server you specify in the first stanza of your TSM System Preferences file.

Place the ***defaultserver*** option at the beginning of your TSM System Preferences file before any server stanzas.

Figure 1 on page 61 shows a sample TSM System Preferences file.

```
DEFAULTServer                server2

SErvername     server1
  NODename                   node1
  COMMMethod                 TCPip
  TCPPort                    1500
  TCPServeraddress           node.domain.company.com
  PASSWORDAccess             generate

SErvername     server2
  NODename                   node2
  COMMMethod                 TCPip
  TCPPort                    1500
  TCPServeraddress           almvmd.almaden.ibm.com
  PASSWORDAccess             prompt
```

Figure 1. Sample TSM System Preferences file

Use the ***servername*** option in the TSM User Preferences file to specify a server to contact for backup-archive services. This overrides the default server specified in your TSM System Preferences file.

Node options

Table 16. Server and Node Options

Option	Description	Page
defaultserver	The name of the Tivoli Storage Manager server to contact for backup-archive services by default if more than one server is defined in the TSM System Preferences file.	76
nodename	Use the ***nodename*** option in your TSM System Preferences file *within* a server stanza to identify your workstation to the server to establish communications.	96
servername	In the TSM System Preferences file, this option specifies the name of a server. In the TSM User Preferences file, this option specifies the Tivoli Storage Manager server to contact for services.	116
virtualnodename	The ***virtualnodename*** option specifies the node name of your workstation when you want to restore or retrieve files to a different workstation.	126

Backup and archive processing options

You can use the following options to control some aspects of backup and archive processing.

Table 17. Backup and archive processing options

Option	Description	Page
autofsrename	Specifies whether to rename an existing file space on a Unicode-enabled server so a Unicode-enabled file space can be created for the current operation.	67
changingretries	Specifies the number of retries when attempting to back up or archive a file that is in use.	69

Table 17. Backup and archive processing options (continued)

Option	Description	Page
compressalways	The ***compressalways*** option specifies whether to continue compressing an object if it grows during compression, or resend the object uncompressed. Use this option with the ***compression*** option.	73
compression	The ***compression*** option compresses files *before* you send them to the server. Compressing your files reduces data storage for backup versions and archive copies of your files.	74
dirmc	Specifies the management class to use for directories. If you do not specify this option, the client uses the management class in the active policy set of your policy domain with the longest retention period.	77
domain	Specifies the volumes to include in your default client domain for an incremental backup.	78
exclude ***exclude.backup*** ***exclude.file*** ***exclude.file.backup***	*These options are equivalent*. Use these options to exclude a file or group of files from backup services.	81
exclude.archive	Excludes a file or a group of files that match the pattern from archive services *only*.	81
exclude.compression	Excludes files from compression processing if you set the ***compression*** option to *yes*. This option applies to backups and archives.	81
exclude.dir	Excludes a directory, its files, and all its subdirectories and their files from backup processing.	81
exclude.fs	Excludes file spaces matching a pattern.	81
guitreeviewafterbackup	Specifies whether the client is returned to the Backup, Restore, Archive, or Retrieve window after a successful operation completes.	84
inclexcl	Specifies the path and file name of an include-exclude options file.	85
include ***include.backup*** ***include.file***	*These options are equivalent*. Use these options to include files or assign management classes for backup processing.	87
include.archive	Includes files or assigns management classes for archive processing.	87
include.compression	Includes files for compression processing if you set the ***compression*** option to *yes*. This option applies to backups and archives.	87
memoryefficientbackup	Specifies a memory-saving backup algorithm for incremental backups when used with the **incremental** command.	95
subdir	Specifies whether to include subdirectories of a named directory.	117
tapeprompt	Specifies whether you want Tivoli Storage Manager to wait for a tape to mount if it is required for a backup, archive, restore, or retrieve process, or to be prompted for a choice.	118

Restore and retrieve processing options

The following options relate to restore and retrieve processing.

Table 18. Restore and retrieve processing options

Option	Description	Page
guitreeviewafterbackup	Specifies whether the client is returned to the Backup, Restore, Archive, or Retrieve window after a successful operation completes.	84
localbackupset	Specifies whether the Tivoli Storage Manager GUI bypasses initial logon with the server to restore a local backup set on a standalone workstation.	91
replace	Specifies whether to overwrite an existing file, or to prompt you for your selection when you restore or retrieve files.	108
subdir	Specifies whether you want to include subdirectories of a named directory.	117
tapeprompt	Specifies whether you want Tivoli Storage Manager to wait for a tape required for a restore or retrieve to be mounted, or to prompt you for your choice.	118

Scheduling options

You can use the following options to regulate central scheduling. Tivoli Storage Manager uses scheduling options only when the Scheduler is running.

Table 19. Scheduling options

Option	Description	Page
maxcmdretries	Specifies the maximum number of times the client scheduler attempts to process a scheduled command that fails.	94
postschedulecmd, postnschedulecmd	Specifies a command to process after running a schedule.	102
preschedulecmd, prenschedulecmd	Specifies a command to process before running a schedule.	104
queryschedperiod	Specifies the number of hours the client scheduler waits between unsuccessful attempts to contact the server for scheduled work.	106
retryperiod	Specifies the number of minutes the client scheduler waits between attempts to process a scheduled command that fails or between unsuccessful attempts to report results to the server.	111
schedcmddisabled	Specifies whether to disable the scheduling of generic commands specified by your Tivoli Storage Manager administrator.	112
schedcompleteaction	Specifies an action to take after a schedule has been completed.	113
schedlogname	Specifies the path and file name where you want to store schedule log information.	114

Table 19. Scheduling options (continued)

Option	Description	Page
schedlogretention	Specifies the number of days to keep log file entries in the schedule log, and whether to save pruned entries.	115

Format and language options

You can use the following options to select different formats for date, time, numbers, and for different languages if you have the appropriate client language pack installed for that language.

Table 20. Format and language options

Option	Description	Page
dateformat	Specifies the format for displaying dates.	75
language	Specifies the language used for messages.	89
numberformat	Specifies the format for displaying numbers.	97
timeformat	Specifies the format for displaying time.	123

Command processing options

The following options apply when you use Tivoli Storage Manager commands.

Table 21. Command processing options

Option	Description	Page
matchallchar	Specifies the character to use as a match-all wildcard character.	92
matchonechar	Specifies the character to use as a match-one-character wildcard character.	93
quiet	Limits the number of messages that display on your screen during processing. This option can be overidden by the server.	107
verbose	Specifies that processing information should display on your screen. The alternative is ***quiet***. This option can be overridden by the server.	125

Authorization options

These options control access to a Tivoli Storage Manager server.

Table 22. Authorization options

Option	Description	Page
password	Specifies a Tivoli Storage Manager password.	98
passwordaccess	Specifies whether you want to generate your password automatically or set as a user prompt.	99

Table 22. Authorization options (continued)

Option	Description	Page
passworddir	Specifies the directory in which you want to store the automatically generated password for your client node. The encryption key and password are encrypted and stored in the TSM.PWD file.	101

Error processing options

These options specify the name of the error log file and how Tivoli Storage Manager treats the entries in the log file.

Table 23. Error processing options

Option	Description	Page
errorlogname	Specifies the fully qualified path and file name of the file where you want to store information about errors that occur during processing.	79
errorlogretention	Specifies how many days to maintain error log entries before pruning, and whether to save the pruned entries.	80

Transaction processing options

These options control how Tivoli Storage Manager processes transactions between the client and server.

Table 24. Transaction processing options

Option	Description	Page
commrestartduration	Specifies the maximum number of minutes you want the client to try to reconnect to a Tivoli Storage Manager server after a communication error occurs.	71
commrestartinterval	Specifies the number of seconds you want the client to wait between attempts to reconnect to a Tivoli Storage Manager server after a communication error occurs.	72
largecommbuffers	Specifies whether the client uses increased buffers to transfer large amounts of data between the client and the server.	90
resourceutilization	Use the ***resourceutilization*** option in your TSM System Preferences file *within* a server stanza to regulate the level of resources the Tivoli Storage Manager server and client can use during processing.	109

Client options reference

The following sections contain detailed information about each of the Tivoli Storage Manager processing options. Information for each option includes:

- A description of the option.

- A syntax diagram of the option. The option name contains uppercase and lowercase characters. The uppercase characters indicate the minimum abbreviation you can use for the option name. See “Reading syntax diagrams” on page viii for an explanation of these diagrams.
- Detailed descriptions of the option parameters. If the parameter is a constant (a value that does not change), use the minimum abbreviation.
- Examples of using the option in the Preferences file.

Note: For options with a **yes** parameter, acceptable alternatives are **1**, **true**, and **on**. For options with a **no** parameter, acceptable alternatives are **0**, **false**, and **off**.

Autofsrename

The ***autofsrename*** option renames an existing file space on a server so that a Unicode-enabled file space with the original name can be created for the current operation.

When you specify `autofsrename yes` in your TSM System Preferences file, and the server value of ***autofsrename*** is set to `client`, Tivoli Storage Manager generates a unique name by appending _OLD to the file space name you specify in the current operation. For example, Tivoli Storage Manager renames the file space Mac OS X to Mac OS X_OLD. If the new file space name is too long, the suffix replaces the last characters of the file space name, as follows:

```
"Mac OS X"
```

If the new file space name already exists on the server, Tivoli Storage Manager renames the new file space ″Mac OS X_OLDx″, where x is a unique number.

Tivoli Storage Manager proceeds to create new Unicode-enabled file spaces that contain only the data specified in the current operation. For example, if you archive all of the .log files in the Mac OS X:logs folder, before the archive takes place, the server renames the file space to ″Mac OS X_OLD″. The archive places the data specified in the current operation into the Unicode-enabled file space named ″Mac OS X″. The new Unicode-enabled file space now contains only the :logs directory and the *.log files specified in the operation. Tivoli Storage Manager stores all subsequent full and partial incremental, selective backup, and archive data in the new Unicode-enabled file spaces.

Renamed file spaces remain on the server as stabilized file spaces. *These file spaces contain all the original data, which you can restore as long as they remain on the server.*

Note: When an existing file space is renamed during Unicode conversion, any access rules defined for the file space remain applicable to the original file space. However, new access rules must be defined to apply to the new Unicode file space, if necessary.

After installation perform a full incremental backup and rename all existing file spaces that are not Unicode enabled and back up the files and directories within them under the new Unicode-enabled file spaces. This operation requires increased processing time and storage on the server.

File spaces that are not Unicode enabled can be viewed in the character set of the locale from which Tivoli Storage Manager backed up the files. A workstation running in a different locale may be unable to view or restore from these file spaces. Unicode-enabled file spaces that are backed up in one locale are visible in all other locales, provided that the workstation has the proper fonts installed. For more information on migrating to Unicode-enabled file spaces, see “Migrating to the Unicode-enabled client” on page 1.

To restore or retrieve from a file space that is not Unicode enabled, specify the source on the server and the destination on the client.

Supported Clients

This option is valid for all Macintosh clients. The server can define the ***autofsrename*** option and override the ***autofsrename*** setting on the client. The Tivoli Storage Manager client API does not support this option.

Preferences File

Place this option in the TSM System Preferences file.

Syntax

Parameters

Yes Specifies that Tivoli Storage Manager automatically renames all file spaces that are not Unicode enabled in the current backup or archive operation.

No Specifies that Tivoli Storage Manager does not rename file spaces that are not Unicode enabled in the current backup or archive operation.

Prompt
Specifies that Tivoli Storage Manager prompts you whether to rename the file spaces that are not Unicode enabled in the current operation. This is the default.

Considerations:

1. This option applies *only* when the server sets the ***autofsrename*** option to `client`.
2. When the client scheduler is running, the default behavior is to not prompt. The next interactive session prompts you to rename the file space.
3. The client prompts one time per file space *only*. If you specify `no` at the prompt, the client cannot rename the file spaces later. However, the Tivoli Storage Manager administrator can rename the file spaces on the server.
4. When backing up files to a file space that is not Unicode enabled, the Unicode-enabled client skips the files and directories with names containing characters from a code page that is different from the current locale.
5. If files and directories with names containing characters from a code page other than the current locale were previously backed up with a client that was not Unicode enabled, they may be expired. The Unicode-enabled client expires these files if you do not migrate the file space to a Unicode-enabled file space. You can back up and archived these files to a Unicode-enabled file space.

Examples

TSM System Preferences:

```
autofsrename yes
```

Changingretries

The ***changingretries*** option specifies how many additional times you want the client to attempt to back up or archive a file that is in use.

Use this option only when *serialization*, an attribute in a management class copy group, is *shared static* or *shared dynamic*.

With *shared static* serialization, if a file is open during an operation, the operation repeats the number of times that you specify. If the file is open during each attempt, the operation does not complete.

With *shared dynamic* serialization, if a file is open during an operation, the operation repeats the number of times that you specify. The backup or archive occurs during the last attempt whether the file is open or not.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza.

Syntax

Parameters

numberretries
Specifies the number of times a backup or archive operation is attempted if the file is in use. The range of values is zero through 4; the default is 4.

Examples

TSM System Preferences:

```
changingretries 3
```

Commmethod

The ***commmethod*** option specifies the communication method you use to provide connectivity for client-server communication.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza.

Syntax

Parameters

TCPip
The Transmission Control Protocol/Internet Protocol (TCP/IP) communication method. This is the default.

Examples

TSM System Preferences:

```
commm tcpip
```

Commrestartduration

The ***commrestartduration*** option specifies the maximum number of minutes you want the client to try to reconnect to a Tivoli Storage Manager server after a communication error occurs.

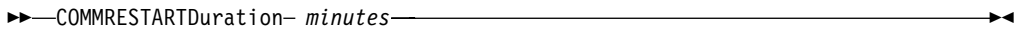
Note: A scheduled event will continue if the client reconnects with the server before the ***commrestartduration*** value elapses, even if the event's startup window has elapsed.

You can use the ***commrestartduration*** option and the ***commrestartinterval*** in busy or unstable network environments to decrease connection failures.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza.

Syntax



Parameters

minutes
The maximum number of minutes you want the client to attempt to reconnect with a server after a communication failure occurs. The range of values is zero through 9999; the default is 60.

Examples

TSM System Preferences:

```
commrestartduration 90
```

Commrestartinterval

The ***commrestartinterval*** option specifies the number of seconds you want the client to wait between attempts to reconnect to a Tivoli Storage Manager server after a communication error occurs.

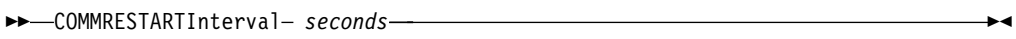
Note: Use this option only when ***commrestartduration*** is a value greater than zero.

You can use the ***commrestartduration*** option and the ***commrestartinterval*** in busy or unstable network environments to decrease connection failures.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza.

Syntax



Parameters

seconds

The number of seconds you want the client to wait between attempts to reconnect with a server after a communication failure occurs. The range of values is zero through 65535; the default is 15.

Examples

TSM System Preferences:

```
commrestartinterval 30
```

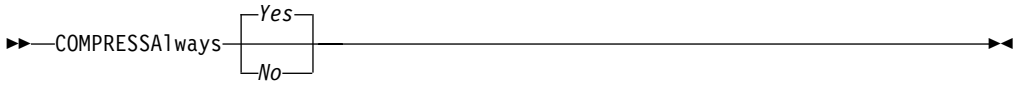
Compressalways

The ***compressalways*** option specifies whether to continue compressing an object if it grows during compression, or resend the object uncompressed. Use this option with the ***compression*** option.

Preferences File

Place this option in the TSM User Preferences file.

Syntax



Parameters

Yes File compression continues even if the file grows as a result of compression. This is the default.

No Backup-archive client objects are resent uncompressed if they grow during compression.

Examples

TSM User Preferences:

```
compressalways yes
```

Compression

The ***compression*** option compresses files *before* you send them to the server. Compressing your files reduces data storage for backup versions and archive copies of your files. It can, however, affect Tivoli Storage Manager throughput. A fast processor on a slow network connection benefits from compression, but a slow processor on a fast network connection does not.

If you set the ***compressalways*** option to *yes*, compression continues even if the file size increases. To stop compression if the file size grows, and resend the file uncompressed, set the ***compressalways*** option to *no*.

If you set the ***compression*** option to *yes*, you can control compression processing in the following ways:

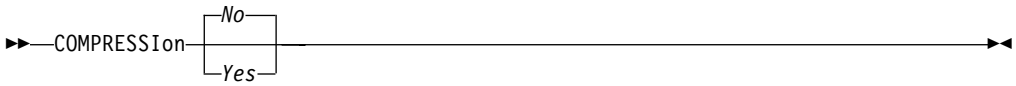
- Use the ***exclude.compression*** option in your TSM System Preferences file to exclude specific files or groups of files from compression processing. See "Exclude options" on page 81 for more information.
- Use the ***include.compression*** option in your TSM System Preferences file to include files within a broad group of excluded files for compression processing. See "Include options" on page 87 for more information.

This option controls compression *only if* your administrator specifies that your client node can compress files before sending them to the server.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza.

Syntax



Parameters

No Files are not compressed before they are sent to the server. This is the default.

Yes Files are compressed before they are sent to the server.

Examples

TSM System Preferences:

```
compression yes
```

Dateformat

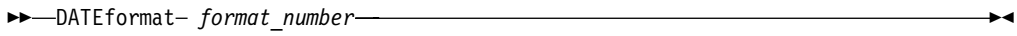
The ***dateformat*** option specifies the format you want to use to display dates.

Note: When you change the date format and use the ***schedlogretention*** option to prune the schedule log, Tivoli Storage Manager removes all entries in the schedule log with a different date format when pruning the log. When you change the date format and use the ***errorlogretention*** option to prune the error log, Tivoli Storage Manager removes all entries in the error log with a different date when pruning the log. When changing the date format, copy the schedule log and error log if you want to preserve log entries that contain a different date format.

Preferences File

Place this option in the TSM User Preferences file.

Syntax



Parameters

format_number

Displays the date using one of the following formats. Select the number that corresponds to the date format you want to use:

1 MM/DD/YYYY
2 DD-MM-YYYY
3 YYYY-MM-DD
4 DD.MM.YYYY
5 YYYY.MM.DD

Examples

TSM User Preferences:

```
dateformat 3
```

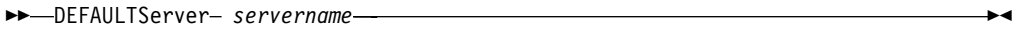
Defaultserver

Use the ***defaultserver*** option to specify the name of the Tivoli Storage Manager server to contact for backup-archive services by default if more than one server is defined in the TSM System Preferences file.

Preferences File

Place this option *at the beginning* of the TSM System Preferences file *before* any server stanzas.

Syntax



Parameters

servername
Specifies the name of the default server to which you back up or archive files.

Examples

TSM System Preferences:

```
defaults server_a
```

Dirmc

The ***dirmc*** option specifies the management class you want to use for directories. If you do not specify this option to associate a management class with directories, the client program uses the management class in the active policy set of your policy domain with the longest retention period. Select a management class for individual directories that retains directories at least as long as it retains the files associated with them.

If you specify a management class with this option, all directories specified in a backup operation are bound to that management class.

The ***dirmc*** option specifies the management class of directories you back up and does not effect archived directories. Archived directories are always bound to the default management class.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza.

Syntax

Parameters

mgmtclassname
Specifies the name of the management class you want to associate with directories. The client uses the management class name that you specify for all directories that you back up. If you do not specify this option, the client associates the management class with the longest retention period with directories.

Examples

TSM System Preferences:

```
dirm managdir
```

Domain

The ***domain*** option specifies the volumes that you want to include for incremental backup in your client domain.

Notes:
1. The Tivoli Storage Manager client API does not support this option.
2. The server can also define this option.

Use the ***domain*** option in your TSM System Preferences file to define your default client domain. Tivoli Storage Manager uses your default client domain when your administrator defines a schedule to run an incremental backup for you, but does not specify which volumes to process

If you do not use the ***domain*** option to specify volumes in your TSM System Preferences file, Tivoli Storage Manager uses the *all-local* parameter as the default.

You can also exclude volumes by specifying the dash (-) operator before the volumes. For example, in the following option Tivoli Storage Manager will process all local volumes except for the home: volume:

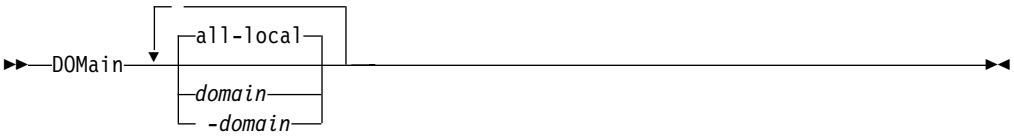
```
domain ALL-LOCAL -home:
```

Note: You cannot use the (-) operator in front of a domain keyword such as ALL-LOCAL.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza.

Syntax



Parameters

all-local
Backs up all local volumes. This is the default.

domain
Defines the volumes to include in your default client domain.

A volume name must be enclosed in quotes if it includes any spaces.

-domain
Defines the volumes to exclude in your default client domain.

Examples

TSM System Preferences:

```
domain all-local
domain all-local -home:
```

Errorlogname

The ***errorlogname*** option specifies the fully qualified path and file name of the file in which to store information about errors that occur during processing.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza.

Syntax

Parameters

filespec

The fully qualified path and file name in which to store error log information. If any part of the path you specify does not exist, Tivoli Storage Manager attempts to create it.

The default file name is 'TSM Error Log'; it is placed in your current working directory.

Examples

TSM System Preferences:

```
errorlogname "TSM Error Log"
```

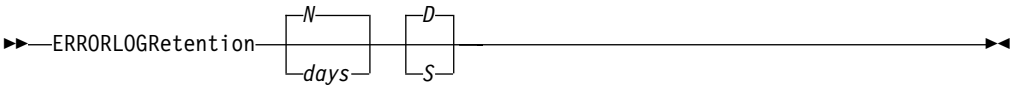
Errorlogretention

The ***errorlogretention*** option specifies how many days to maintain error log entries before pruning, and whether to save the pruned entries. The error log is pruned when the first error is written to the log after a Tivoli Storage Manager session is started. If the only session you run is the client scheduler, and you run it twenty-four hours a day, the error log might not be pruned according to your expectations. Stop the session and start it again to prune the error log when the next error is written.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza.

Syntax



Parameters

N or *days*
Specifies how long to wait before pruning the error log.

N Do not prune the error log. This permits the error log to grow indefinitely. This is the default.

days
The number of days to keep log file entries before pruning the log. The range of values is zero through 9999.

D or *S*
Specifies whether to save the pruned entries. Enter a space or comma to separate this parameter from the previous one.

D Discard the error log entries when you prune the log. This is the default.

S Save the error log entries when you prune the log.

The pruned entries are copied from the error log to **TSM Error Pruned Log**.

Examples

TSM System Preferences:

```
errorlogretention 400 S
```

Exclude options

The exclude options exclude objects from backup or archive services. For example, you might want to exclude all temporary files, any local caches of network files, all files that contain compiled object code that you can easily reproduce using other methods, or your operating system files.

Notes:

1. With the exception of ***exclude.fs***, when you exclude a file that was previously included, existing backup versions become inactive during the next incremental backup.
2. The server can define exclude options with the ***inclexcl*** option.

Exclude any system files that could corrupt the operating system when recovered. You should also exclude the client directory containing the client files.

Attention: See "Excluding system files" on page 15 for a list of files that you should always exclude.

Use wildcard characters to exclude a broad range of files. See "Including and excluding groups of files" on page 15 for a list of wildcard characters that you can use. Then, if necessary, use the ***include*** option to make exceptions.

To exclude an entire directory called any:test, enter the following:

```
exclude.dir any:test
```

To exclude subdirectories that begin with `test` under the `any` directory, enter the following:

```
exclude.dir any:test*
```

Compression processing

If you want to exclude specific files or groups of files from compression processing during a backup or archive operation, consider the following:

- You must set the ***compression*** option to *yes* to enable compression processing. If you do not specify the ***compression*** option or you set the ***compression*** option to *no*, Tivoli Storage Manager does not perform compression processing. See "Compression" on page 74 for more information.

  If you set the ***compression*** option to *yes* and no ***exclude.compression*** statements exist, Tivoli Storage Manager considers all files for compression processing.
- Tivoli Storage Manager processes ***exclude.fs, exclude.dir,*** and other include-exclude statements first. Tivoli Storage Manager then considers any ***exclude.compression*** statements. For example, consider the following include-exclude list:

  ```
  exclude home:jones:proj1:*.*
  exclude.compression home:jones:proj1:file.txt
  include home:jones:proj1:file.txt
  ```

  Tivoli Storage Manager examines the statements (reading from bottom to top) and determines that the home:jones:proj1:file.txt file is a candidate for back up, but is not a candidate for compression processing.
- Include-exclude compression processing is valid for backup and archive processing *only*. The ***exclude.compression*** option does not affect whether files are excluded from backup or archive processing, only whether they are excluded from compression processing.

- As with other include-exclude statements, you can use the ***inclexcl*** option to specify a file which is in Unicode format which contains ***exclude.compression*** statements specifying Unicode files. See "Inclexcl" on page 85 for more information.

Preferences File

Place these options in the TSM System Preferences file *within* a server stanza.

Syntax

exclude, exclude.backup, exclude.file, exclude.file.backup
These options are equivalent. Use these options to exclude a file or group of files from backup services.

exclude.archive
Excludes a file or a group of files that match the pattern from archive services *only*.

exclude.compression
Excludes files from compression processing if the ***compression*** option is set to *yes*. This option applies to backups and archives.

exclude.dir
Excludes a directory, its files, and all its subdirectories and their files from backup processing. For example, the statement exclude.dir test:dan:data1 excludes the test:dan:data1 directory, its files, and all its subdirectories and their files.

exclude.fs
Excludes file spaces matching the pattern. The client does not consider the specified file space for processing and the usual deleted-file expiration process cannot occur. If you exclude a file space that was previously included, existing backup versions remain on the server subject to retention rules specified in the associated management class definition.

Parameters

pattern
Specifies the file or group of files that you want to exclude. End the pattern with a file specification.

If the pattern begins with a single or double quote or contains any embedded blanks or equal signs, you must surround the value in either single (') or double (") quotation marks. The opening and closing quotation marks must be the same type of quotation marks.

Examples

TSM System Preferences:

```
exclude ...:DeskTop
exclude HFS+:svt1:testdir:...:*
exclude.archive HFS+:svt1:testdir:...:*
exclude.fs HFS+:svt1:testdir:...:*
exclude.backup HFS+:svt1:testdir:...:*
```

```
exclude.dir HFS+:svt1:testdir:...:*
exclude.file HFS+:svt1:testdir:...:*
exclude.compression home:jones:proj1:file.txt
```

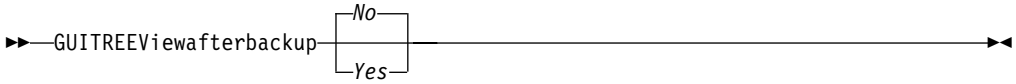
Guitreeviewafterbackup

The ***guitreeviewafterbackup*** option specifies whether the client returns to the Backup, Restore, Archive, or Retrieve window after a successful operation completes.

Preferences File

Place this option in the TSM User Preferences file.

Syntax



Parameters

No Returns you to the Tivoli Storage Manager main window after a successful operation completes. This is the default.

Yes Returns you to the Backup, Restore, Archive, or Retrieve window after a successful operation completes.

Examples

TSM User Preferences:

```
guitreeviewafterbackup yes
```

Inclexcl

The ***inclexcl*** option specifies the path and file name of an include-exclude options file.

Multiple inclexcl statements are permitted. However, you must specify this option for each include-exclude file.

Ensure that you store your include-exclude options file in a directory to which all users have read access.

When processing occurs, the include-exclude statements within the include-exclude file are placed in the list position occupied by the ***inclexcl*** option, in the same order, and processed accordingly.

Considerations

The include-exclude file can be in Unicode or non-Unicode format. If you specify a non-Unicode include-exclude file, the file name must be in the same code page as the one that the client is running.

A Unicode include-exclude file provides the following benefits:

- Names with characters from another code page no longer have to be identified with wildcard characters.
- File names and directories from any code page can be *fully specified* for the client to process.

To create an include-exclude file in Unicode format, perform the following steps:

1. Open a text editor.
2. List your ***include*** and ***exclude*** statements. See Table 4 on page 14 for include-exclude options you can use.
3. Click **File** and then click **Save As**. The Save As window is displayed.
4. Select the **Save as Unicode** checkbox, specify the file and target directory, and save the file.
5. Place an ***inclexcl*** option specifying the include-exclude file you just created in your TSM System Preferences file.

For more information about creating an include-exclude options file, see “Creating an include-exclude list (optional)” on page 11.

Supported Clients

This option is valid for all the Macintosh OS X client *only*.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza.

Syntax

Parameters

filespec
Specifies the path and file name of *one* include-exclude options file.

Examples

TSM System Preferences:

```
inclexcl vol1:documents:backup.excl
```

Include options

The include options specify one of the following:

- Objects within a broad group of excluded objects that you want to include for backup and archive services.
- Objects to which you want to assign a specific management class and a management class name.
- A management class to assign to all objects to which you do not explicitly assign a management class.

If you do not assign a specific management class to objects, Tivoli Storage Manager uses the default management class in the active policy set of your policy domain.

Notes:

1. The ***exclude.fs*** and ***exclude.dir*** statements override all include statements that match the pattern.
2. The server can also define these options with the ***inclexcl*** option.

Compression processing

If you want to include specific files or groups of files for compression processing during a backup or archive operation, consider the following:

- You must set the ***compression*** option to *yes* to enable compression processing. If you do not specify the ***compression*** option or you set the ***compression*** option to *no*, Tivoli Storage Manager does not perform compression processing. See "Compression" on page 74 for more information.
- Tivoli Storage Manager processes ***exclude.fs, exclude.dir,*** and other include-exclude statements first. Tivoli Storage Manager then considers any ***include.compression*** statements. For example, consider the following include-exclude list:

  ```
  exclude home:jones:proj1:file.txt
  include.compression home:jones:proj1:file.txt
  ```

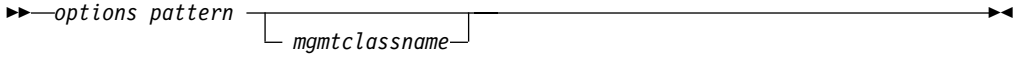
  Tivoli Storage Manager examines the `exclude home:jones:proj1:file.txt` statement first and determines that `home:jones:proj1:file.txt` is excluded from processing and is not a candidate for compression processing.
- Include-exclude compression processing is valid for backup and archive processing *only*.
- As with other include-exclude statements, you can use the ***inclexcl*** option to specify a file which is in Unicode format which contains ***include.compression*** statements specifying Unicode files. See "Inclexcl" on page 85 for more information.

See "Creating an include-exclude list (optional)" on page 11 for more information.

Preferences File

Place these options in the TSM System Preferences file *within* a server stanza.

Syntax



include, include.backup, include.file
These options are equivalent. Use these options to include files or assign management classes for backup processing.

include.archive
Includes files or assigns management classes for archive processing.

include.compression
Includes files for compression processing if you set the ***compression*** option to *yes*. This option applies to backups and archives.

Parameters

pattern
Specifies the objects to include for backup or archive processing or to assign a specific management class. End the pattern with a file specification.

If the pattern begins with a single or double quote or contains any embedded blanks or equal signs, you must surround the value in either single (') or double (") quotation marks. The opening and closing quotation marks must be the same type of quotation marks.

mgmtclassname
Specifies the name of the management class to assign to the objects. If a management class is not specified, the default management class is used.

Examples

TSM System Preferences:

```
include hfs+:svt1:testdir:*
include ...:Data:Test:Test*
include ...:System:...:* mgmtcls1
include ...:* managall
include.archive hfs+:svt1:testdir:*
include.compression home:jones:proj1:file.txt
include.backup home:proj:text:* mybackupclass
```

Language

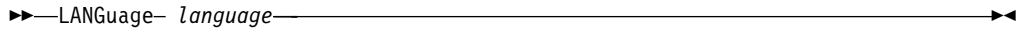
The ***language*** option specifies the national language in which to present client messages.

You can use American English (ENU) with all clients. Currently, the Macintosh client only supports American English (ENU).

Preferences File

Place this option in the TSM User Preferences file.

Syntax



Parameters

language
Specifies the language you want to use.

Examples

TSM User Preferences:

```
language enu
```

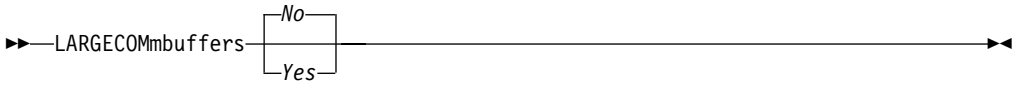
Largecommbuffers

The ***largecommbuffers*** option specifies whether the client uses increased buffers to transfer large amounts of data between the client and the server. You can disable this option when your workstation is running low on memory.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza.

Syntax



Parameters

No Specifies that increased buffers *are not* used to transfer large amounts of data to the server. This is the default.

Yes Specifies that increased buffers *are* used to transfer large amounts of data to the server.

Note: If you set the ***largecommbuffers*** option to *yes* in your TSM Preferences file to enable large communication buffers, you may receive the following error message when starting a Tivoli Storage Manager client:

```
ANS1030E System ran out of memory. Process ended.
```

For Mac OS 9, the fix for this problem is to raise the amount of memory the application gets by selecting **Get Info** in the Finder, and increasing the *Preferred Size* by at least 5MB. Consult your system documentation for help on how to do this.

Examples

TSM System Preferences:

```
largecommbuffers yes
```

Localbackupset

The ***localbackupset*** option specifies whether the Tivoli Storage Manager GUI bypasses initial logon with the Tivoli Storage Manager server to restore a local backup set on a standalone workstation. .

If you set the ***localbackupset*** option to *yes*, the GUI does not attempt initial logon with the server. In this case, the GUI only enables the restore functionality.

If you set the ***localbackupset*** option to *no* (the default), the GUI attempts initial logon with the server and enables all GUI functions.

Supported Clients

This option is valid for all Macintosh clients.

Preferences File

Place this option in the TSM User Preferences file.

Syntax

Parameters

No Specifies that the GUI attempts initial logon with the server and enables all functions. This is the default.

Yes Specifies that the GUI does not attempt initial logon with the server and enables only the restore functionality.

Examples

TSM User Preferences:

```
localbackupset yes
```

Matchallchar

The ***matchallchar*** option specifies the character to use as a match-all wildcard character. For example, File* matches File1, FileA1, and File.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza before any include or exclude statements.

Syntax

Parameters

character
Specifies a character to use as a match-all wildcard character. The default is an asterisk (*). You can use any valid ASCII character for the ***matchallchar*** option *except* Control+X or Control+Y. Do not use the same character for both the ***matchallchar*** and the ***matchonechar*** option.

Examples

TSM System Preferences:

```
matchallchar *
```

Matchonechar

The ***matchonechar*** option specifies the character to use as a match-one wildcard character. For example, File? matches File1, but it does not match File or File10.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza before any include or exclude statements.

Syntax

Parameters

character
Specifies a character to use as a match-one wildcard character. The default is a question mark (?). You can use any valid ASCII character for the ***matchonechar*** option, *except* Control+X or Control+Y. Do not use the same character for both the ***matchallchar*** and the ***matchonechar*** option.

Examples

TSM System Preferences:

```
matchonechar #
```

Maxcmdretries

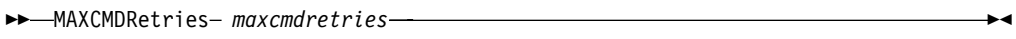
The ***maxcmdretries*** option specifies the maximum number of times the client scheduler (on your workstation) attempts to process a scheduled command that fails. The command retry starts *only if* the client scheduler has not yet backed up a file, never connected to the server, or failed before backing up a file. Use this option *only when* the scheduler is running.

Your administrator can also set this option. If your administrator specifies a value for this option, that value overrides what you specify in the TSM System Preferences file *after* your client node successfully contacts the server.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza.

Syntax



Parameters

maxcmdretries
Specifies the number of times the client scheduler can attempt to process a scheduled command that fails. The range of values is zero through 9999; the default is 2.

Examples

TSM System Preferences:

```
maxcmdr 4
```

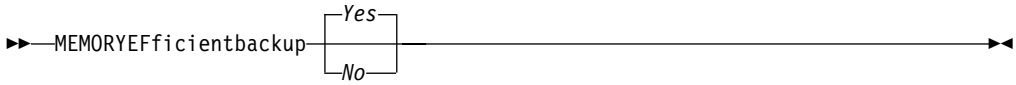
Memoryefficientbackup

The ***memoryefficientbackup*** option specifies a memory-conserving algorithm for processing incremental backups, that backs up one directory at a time, using less memory. Use this option with the **incremental** command when your workstation is memory constrained.

Preferences File

Place this option in the TSM User Preferences file.

Syntax



Parameters

No Your client node uses the faster, more memory-intensive method when processing incremental backups.

Yes Your client node uses the method that requires less memory when processing incremental backups. This is the default.

Examples

TSM User Preferences:

```
memoryefficientbackup yes
```

Nodename

Use the ***nodename*** option in your TSM System Preferences file *within* a server stanza to identify your workstation to the server. You can use different node names to identify multiple operating systems on your workstation.

If you do not specify this option in the TSM System Preferences file, Tivoli Storage Manager prompts you for the node name when it starts.

When you use the ***nodename*** option, Tivoli Storage Manager prompts for the password assigned to the node you specify, if a password is required.

If you want to restore or retrieve files from the server while you are working from a different workstation, use the ***virtualnodename*** option. See "Virtualnodename" on page 126 for more information.

When connecting to a server, the client must identity itself to the server. This login identification is determined in the following manner:

- In the absence of a ***nodename*** entry in the TSM System Preferences file, or a ***virtualnodename*** entry in the TSM User Preferences file, or a virtual node name specified on a command line, the default login ID is the name that the **hostname** command returns.
- If a ***nodename*** entry exists in the TSM System Preferences file, the ***nodename*** entry overrides the name that the **hostname** command returns.
- If a ***virtualnodename*** entry exists in the TSM User Preferences file, or a virtual node name is specified on a command line, it cannot be the same name as the name returned by the **hostname** command. When the server accepts the virtual node name, a password is required (if authentication is on), even if the ***passwordaccess*** option is *generate*. When a connection to the server is established, access is permitted to any file that is backed up using this login ID.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza.

Syntax

Parameters

nodename
Specifies a 1 to 64 character node name for which you want to request Tivoli Storage Manager services. The default is the name of the workstation.

Permit the node name to default to the workstation name.

Examples

TSM System Preferences:

```
nodename cougar
```

Numberformat

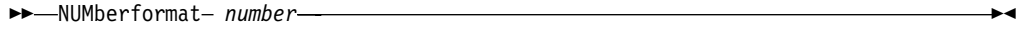
The ***numberformat*** option specifies the format you want to use to display numbers.

Use this option if you want to change the default number format for the language of the message repository you are using.

Preferences File

Place this option in the TSM User Preferences file.

Syntax



Parameters

number

Displays numbers using any one of the following formats. Specify the number (1–6) that corresponds to the number format you want to use.

1 1,000.00
2 1,000,00
3 1 000,00
4 1 000.00
5 1.000,00
6 1'000,00

Examples

TSM User Preferences:

```
num 4
```

Password

The ***password*** option specifies a Tivoli Storage Manager password. If you do not specify this option and your administrator has set authentication to *On*, you are prompted for a password when you start a Tivoli Storage Manager session.

Notes:

1. If the server prompts for a password, the password does not display as you enter it.
2. If the Tivoli Storage Manager server name changes or Tivoli Storage Manager clients are directed to a different Tivoli Storage Manager server, all clients must re-authenticate with the server because the stored encrypted password must be regenerated.

The ***password*** option is ignored when the ***passwordaccess*** option is set to *generate*.

Preferences File

Place this option in the TSM User Preferences file.

Syntax

Parameters

password
Specifies a 1 to 63 character password. A password is not case-sensitive. Valid characters include:

Characters

	Description
A–Z	Any letter, A through Z, uppercase or lowercase
0–9	Any number, 0 through 9
+	Plus
.	Period
_	Underscore
-	Hyphen
&	Ampersand

Examples

TSM User Preferences:

```
password secretword
```

Passwordaccess

The ***passwordaccess*** option specifies whether you want to generate your password automatically or set as a user prompt. Your administrator can require a password for your client node by enabling the authentication feature. Ask your administrator if a password is required for your client node.

If a password is required, you can choose to:

- Set the password for your client node yourself and have Tivoli Storage Manager prompt for it each time you request services.
- Let Tivoli Storage Manager automatically generate a new password for your client node each time it expires, encrypt and store the password in a file, and retrieve the password from that file when you request services. You are not prompted for the password.

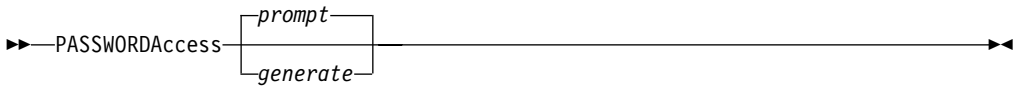
Use the ***passworddir*** option in your TSM System Preferences file to specify the directory location in which to store the encrypted password file. The default directory location depends on how the client was installed.

When the ***passwordaccess*** option is set to *generate* and you specify the ***password*** option, the ***password*** option is ignored.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza.

Syntax



Parameters

prompt

You are prompted for your workstation password each time a client connects to the server. This is the default.

To keep your client node password secure, enter commands without the password and wait for Tivoli Storage Manager to prompt you for the password.

Each user must know the Tivoli Storage Manager password for your client node. Any user who knows the password for your client node can gain access to *all* backups and archives that originate from your client node. For example:

- If the user enters the node name and password for your client node from a different client node, the user becomes a virtual root user.
- If you change the name of your client node (using the ***nodename*** option in the TSM System Preferences file, and you specify the same node name in the TSM User Preferences file, a user who enters the correct password becomes a virtual root user. The same is true if a user specifies the same node name using the ***nodename*** option with a command and enters the correct password.

API applications must supply the password when a session is initiated. The application is responsible for obtaining the password.

generate

Encrypts and stores your password locally and generates a new password when the old password expires.

A password prompt displays when registering a workstation with a server using open registration or if your administrator changes your password manually.

When logging in locally, users do not need to know the Tivoli Storage Manager password for the client node. However, by using the ***nodename*** option at a remote node, users can access files they own and files to which another user grants access. If you change the name of your client node (using the ***nodename*** option in the TSM System Preferences file, and you specify the same node name in the TSM User Preferences file) Tivoli Storage Manager prompts the users for the client node password. If a user enters the correct password, the user becomes a virtual root user. The same is true if a user specifies the same node name using the ***nodename*** option with a command.

Examples

TSM System Preferences:

```
passwordaccess generate
```

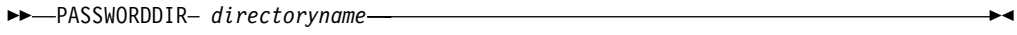
Passworddir

The ***passworddir*** option specifies the directory location in which to store an encrypted password file. The directory location depends upon where the client was installed.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza.

Syntax



Parameters

directoryname
Specifies the path in which to store the encrypted password file. The name of the password file is TSM.PWD. If any part of the specified path does not exist, Tivoli Storage Manager attempts to create it.

Examples

TSM System Preferences:

```
passworddir "HFS+"
```

Postschedulecmd/Postnschedulecmd

The ***postschedulecmd*** option specifies a command that the client program processes after it runs a schedule. The client program waits for the command to complete before it continues with other processing.

If you do not want to wait, specify ***postnschedulecmd***.

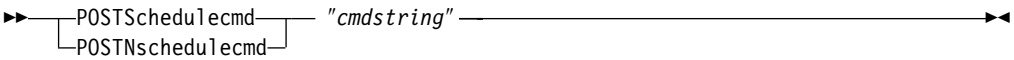
Notes:

1. Successful completion of the ***postschedulecmd*** command is considered a prerequisite to running the scheduled operation. If the ***postschedulecmd*** command does not complete with return code 0, the client will report that the scheduled event completed with return code 8 (unless the scheduled operation encounters a more severe error yielding a higher return code). If you do not want the ***postschedulecmd*** command to be governed by this rule, you can create a script or batch file that invokes the command and exits with return code 0. Then configure ***postschedulecmd*** to invoke the script or batch file. The return code for the ***postnschedulecmd*** command is not tracked, and does not influence the return code of the scheduled event.
2. The server can also define the ***postschedulecmd*** option (and the ***postnschedulecmd*** option).

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza.

Syntax



Parameters

"cmdstring"

Specifies the command to process. You can enter a command to be executed after a schedule with this option. Use only one ***postschedulecmd*** option.

If the command string contains blanks, enclose the command string in double quotes. If you placed double quotes within the command string, then enclose the entire command string in single quotes.

Use a blank, or null, string for *cmdstring* if you want to prevent any commands from running that the Tivoli Storage Manager server administrator uses for ***postschedulecmd*** or ***preschedulecmd***. If you specify a blank or null string on *either* option, it prevents the administrator from using a command on *both* options.

If your administrator uses a blank or null string on the ***postschedulecmd*** option, you cannot run a post-schedule command.

The command string should specify an AppleScript to launch. If it is only a file name, such as *"**Database Script**"*, the client program searches for this file in the Scripts folder inside the Tivoli Storage Manager folder. Otherwise, the command string should contain the full path of the file, such as:

```
"La Pomme:Scripting:Database Script"
```

Examples

TSM System Preferences:

```
postschedulecmd "restart database"
```

The command string is a valid command for restarting your database.

Preschedulecmd/Prenschedulecmd

The ***preschedulecmd*** option specifies a command that the client program processes before it runs a schedule. The client program waits for the command to complete before it starts the schedule.

If you do not want it to wait, specify ***prenschedulecmd***.

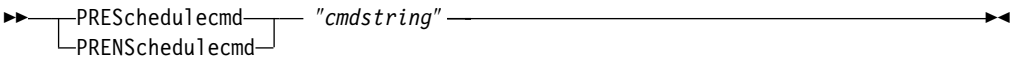
Notes:

1. Successful completion of the ***preschedulecmd*** command is considered to be a prerequisite to running the scheduled operation. If the ***preschedulecmd*** command does not complete with return code 0, the scheduled operation and any ***postschedulecmd*** and ***postnschedulecmd*** commands will not run. The client will report that the scheduled event failed, and the return code will be 12. If you do not want the ***preschedulecmd*** command to be governed by this rule, you can create a script or batch file that invokes the command and exits with return code 0. Then configure ***preschedulecmd*** to invoke the script or batch file. The return code for the ***prenschedulecmd*** command is not tracked, and does not influence the return code of the scheduled event.
2. The server can also define the ***preschedulecmd*** option (and the ***prenschedulecmd*** option).

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza.

Syntax



Parameters

"cmdstring"

Specifies the command to process. Use only one ***preschedulecmd*** option. You can enter a command to be executed before a schedule using this option.

If the command string contains blanks, enclose the command string in double quotes. If you placed double quotes within the command string, then enclose the entire command string in single quotes.

Use a blank or null string for *cmdstring* if you want to prevent any commands from running that the Tivoli Storage Manager server administrator uses for ***postschedulecmd*** and ***preschedulecmd***. If you specify a blank or null string on *either* option, it prevents the administrator from using a command on *both* options.

If your administrator uses a blank or null string on the ***preschedulecmd*** option, you cannot run a pre-schedule command.

The command string should specify an AppleScript to launch. If it is only a file name, such as *"**Database Script**"*, the client program searches for this file in the Scripts folder inside the Tivoli Storage Manager folder. Otherwise, the command string should contain the full path of the file, such as:

```
"La Pomme:Scripting:Database Script"
```

Examples

TSM System Preferences:

```
preschedulecmd "quiesce database"
```

The command string is a valid command for quiescing your database.

This option is valid only on the initial command line. It is not valid in interactive mode.

Queryschedperiod

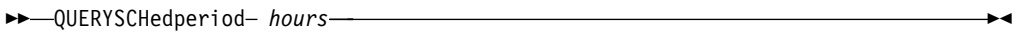
The ***queryschedperiod*** option specifies the number of hours you want the client scheduler to wait between attempts to contact the server for scheduled work. This option applies only when you set the ***schedmode*** option to *polling*. This option is used only when the **scheduler** is running.

Your administrator can also set this option. If your administrator specifies a value for this option, that value overrides the value set in your TSM System Preferences file after your client node successfully contacts the server.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza.

Syntax



Parameters

hours
Specifies the number of hours the client scheduler waits between attempts to contact the server for scheduled work. The range of values is 1 through 9999; the default is 12.

Examples

TSM System Preferences:

```
querysch 6
```

Quiet

The ***quiet*** option limits the number of messages that display on your screen during processing.

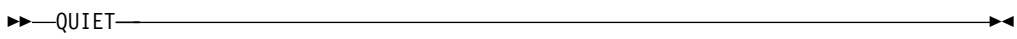
When you use the ***quiet*** option, error and processing information appears on your screen, and messages are written to log files. If you do not specify ***quiet***, the default option, ***verbose*** is used.

Note: The server can also define the **quiet** option, overriding the client setting.

Preferences File

Place this option in the TSM User Preferences file.

Syntax



Parameters

There are no parameters for this option.

Examples

TSM User Preferences:

```
quiet
```

Replace

The ***replace*** option specifies whether to overwrite existing files on your workstation, or to prompt you for your selection when you restore or retrieve files.

Note: Replace prompting does not occur during a scheduled operation. If you set the ***replace*** option to prompt, Tivoli Storage Manager skips files without prompting during a scheduled operation.

Preferences File

Place this option in the TSM User Preferences file.

Syntax

Parameters

Prompt
You are prompted whether to overwrite a file that already exists on your workstation. If the existing file is read-only, you are prompted whether to overwrite it. This is the default.

All
All existing files are overwritten, including read-only files. If access to a file is denied, you are prompted to skip or overwrite the file. No action is taken on the file until there is a response to the prompt.

Yes
Any existing files are overwritten, *except* read-only files. If a file is read-only, you are prompted to overwrite the file or skip it. No action is taken on the file until there is a response to the prompt. If access to a file is denied, the file is skipped.

No Existing files are not overwritten. No prompts will display.

Note: When restoring or retrieving files with the ***replace*** option set to *no*, existing files will not be overwritten, but existing directories will. To leave existing directories intact during a restore or retrieve operation, select the **Options** button → **All selected files and directories** dropdown menu → **Files only** option from the Tivoli Storage Manager GUI.

Examples

TSM User Preferences:

```
quiet
```

Resourceutilization

Use the ***resourceutilization*** option in your TSM System Preferences file *within* a server stanza to regulate the level of resources the Tivoli Storage Manager server and client can use during processing.

Regulating backup and archive sessions

When you request a backup or archive, the client can use more than one session to the server. The default is to use a maximum of two sessions; one to query the server and one to send file data. The client can use only one server session if you specify a ***resourceutilization*** setting of 1. The client is also restricted to a single session if a user who is not an authorized user invokes a Macintosh client with ***passwordaccess***=*generate* specified.

A client can use more than the default number of sessions when connecting to a server that is Version 3.7 or higher. For example, ***resourceutilization***=10 permits up to eight sessions with the server. Multiple sessions may be used for querying the server and sending file data.

Multiple query sessions are used when you specify multiple volumes with a backup or archive command. For example, if you enter:

```
inc filespaceA filespaceB
```

and you specify ***resourceutilization***=5, the client may start a second session to query files on file space B. Whether or not the second session starts depends on how long it takes to query the server about files backed up on file space A. The client may also try to read data from the file system and send it to the server on multiple sessions.

Regulating restore sessions

When you request a restore, the default is to use a maximum of one session, based on how many tapes the requested data is stored on, how many tape drives are available, and the maximum number of mount points allowed for the node.

Notes:

1. If all of the files are on disk, only one session is used. There is no multi-session for a pure disk storage pool restore. However, if you are performing a restore in which the files reside on 4 tapes and some on disk, you could use up to 5 sessions during the restore.
2. The Tivoli Storage Manager server can set the maximum number of mount points a node can use on the server using the MAXNUMMP parameter. If the ***resourceutilization*** option value exceeds the value of the MAXNUMMP on the server for a node, the backup can fail with an *Unknown System Error* message.

For example, if the data you want to restore is on 5 different tape volumes, the maximum number of mount points is 5 for your node, and ***resourceutilization*** is set to 3, then 3 sessions will be used for the restore. If you increase the ***resourceutilization*** setting to 5, then 5 sessions will be used for the restore. There is a 1 to 1 relationship to the number of restore sessions allowed and the ***resourceutilization*** setting. Multiple restore sessions are only allowed for no query restore operations.

Considerations

The following factors can affect the throughput of multiple sessions:

- The server's ability to handle multiple client sessions. Is there sufficient memory, multiple storage volumes, and CPU cycles to increase backup throughput?
- The client's ability to drive multiple sessions (sufficient CPU, memory, etc.).

- The configuration of the client storage subsystem. File systems that are striped across multiple disks, using either software striping or RAID-5 can better handle an increase in random read requests than a single drive file system. Additionally, a single drive file system may not see performance improvement if it attempts to handle many random concurrent read requests.
- Sufficient bandwidth in the network to support the increased traffic.

Potentially undesirable aspects of running multiple sessions include:

- The client could produce multiple accounting records.
- The server may not start enough concurrent sessions. To avoid this, the server *maxsessions* parameter must be reviewed and possibly changed.
- A query node command may not summarize client activity.

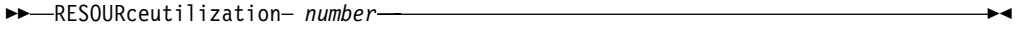
Notes:

1. The Tivoli Storage Manager client API does not support this option.
2. The server can also define this option.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza.

Syntax



Parameters

number
Specifies the level of resources the Tivoli Storage Manager server and client can use during processing. The range of values that you can specify is 1 through 10.

Examples

TSM System Preferences:

```
resourceutilization 8
```

Retryperiod

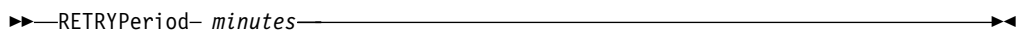
The ***retryperiod*** option specifies the number of minutes the client scheduler waits between attempts to process a scheduled command that fails, or between unsuccessful attempts to report results to the server. Use this option only when the scheduler is running.

Your administrator can also set this option. If your administrator specifies a value for this option, that value overrides the value in your TSM System Preferences file after your client node successfully contacts the server.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza.

Syntax



Parameters

minutes
Specifies the number of minutes the client scheduler waits between attempts to contact the server, or to process a scheduled command that fails. The range of values is 1 through 9999; the default is 20.

Examples

TSM System Preferences:

```
retryp 10
```

Schedcmddisabled

The ***schedcmddisabled*** option specifies whether to disable the scheduling of commands by the server ***action***=**command** option on the **define schedule** server command.

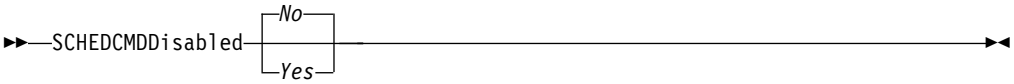
This option does not disable the ***preschedulecmd*** and ***postschedulecmd*** commands. However, you can specify ***preschedulecmd*** or ***postschedulecmd*** with a blank or a null string to disable the scheduling of these commands. Commands scheduled by the server using the ***action***=**command** option on the **define schedule** server command may also be disabled in the same way.

Note: The server can also define this option.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza.

Syntax



Parameters

Yes Specifies that Tivoli Storage Manager disables the scheduling of commands by the server using the ***action***=**command** option on the **define schedule** server command.

No Specifies that Tivoli Storage Manager does not disable the scheduling of commands by the server using the ***action***=**command** option on the **define schedule** server command. This is the default.

Examples

TSM System Preferences:

```
schedcmddisabled no
```

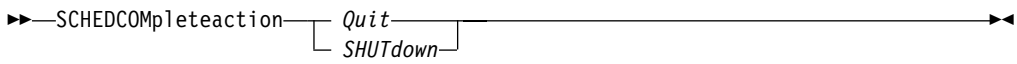
Schedcompleteaction

The ***schedcompleteaction*** option specifies an action to take when a schedule completes. This option is used only when the scheduler is running.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza.

Syntax



Parameters

Quit
The scheduler application quits when a schedule completes.

SHUTdown
Shuts down your workstation when a schedule completes. If there are other applications opened with unsaved data, these applications might prompt the user to save the data. This can prevent the workstation from shutting down until the prompt is dismissed.

Examples

TSM System Preferences:

```
schedcompleteaction shutdown
```

Schedlogname

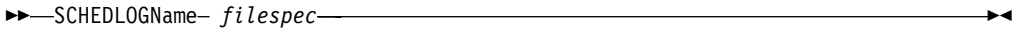
The ***schedlogname*** option specifies the path and file name where you want to store schedule log information. Use this option only when the scheduler is running.

Note: The Tivoli Storage Manager client API does not support this option.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza.

Syntax



Parameters

filespec
Specifies the path and file name where you want to store schedule log information when processing scheduled work. If any part of the path you specify does not exist, Tivoli Storage Manager attempts to create it.

If you specify a file name only, the file is stored in your default folder. The default is the Tivoli Storage Manager application folder and a file name of **TSM Schedule Log**. The **TSM Schedule Log** file *cannot* be a symbolic link.

Examples

TSM System Preferences:

```
schedlogn "HFS+:test"
```

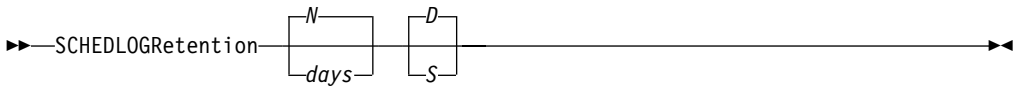
Schedlogretention

The ***schedlogretention*** option specifies the number of days to keep entries in the schedule log, and whether to save the pruned entries. The schedule log is pruned after a scheduled event completes.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza.

Syntax



Parameters

N or *days*
Specifies how long to wait before pruning the schedule log.

N Do not prune the log. This permits the log to grow indefinitely. This is the default.

days
Specifies the number of days to keep log file entries before pruning. The range of values is zero through 9999.

D or *S*
Specifies whether to save the pruned entries. Use a space or comma to separate this parameter from the previous one.

D Discards the log entries when pruning the log. This is the default.

S Saves the log entries when pruning the log.

Tivoli Storage Manager copies the entries pruned from the log to **TSM Sched Pruned Log**.

Examples

TSM System Preferences:

```
schedlogretention 30 S
```

Servername

In your TSM System Preferences file, the ***servername*** option specifies the name you want to use to identify a server and to begin a stanza containing options for that server. You can name and specify options for more than one server.

The following example demonstrates how to specify options for two different servers:

```
SErvername     yakima
 NODename                  node1
 COMMMethod                TCPip
 TCPPort                   1500
 TCPServeraddress          yakima.sanjose.ibm.com
 PASSWORDAccess            generate

SErvername     server2
 NODename                  node2
 COMMMethod                TCPip
 TCPPort                   1500
 TCPServeraddress          almvmd.almaden.ibm.com
 PASSWORDAccess            prompt
```

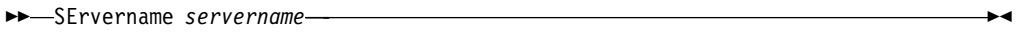
In your TSM User Preferences file, the ***servername*** option specifies which server, of those named in your TSM System Preferences file, to contact for backup-archive services. When specified in a client options file the ***servername*** option overrides the default server specified in your TSM System Preferences file.

Note: If the Tivoli Storage Manager server name changes or Tivoli Storage Manager clients are directed to a different Tivoli Storage Manager server, all clients will need to have a new password initialized for the new server name.

Preferences File

Place this option in the TSM System Preferences file (*to begin* a server stanza) or the TSM User Preferences file.

Syntax



Parameters

servername
In your TSM System Preferences file, specify the name you want to assign to a particular server. In your TSM User Preferences file specify the name of the server you want to contact for backup-archive services. A server name is not case sensitive; it can have up to 64 characters.

Examples

TSM System Preferences or TSM User Preferences:

```
servername yakima
```

Subdir

The ***subdir*** option specifies whether you want to include subdirectories of named directories for processing during backup, archive, restore, retrieve, and query operations.

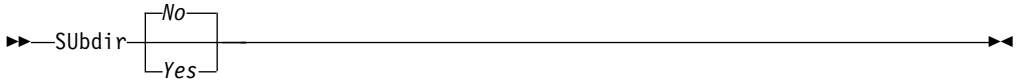
For example, if you set the ***subdir*** option to *yes* when backing up a specific path and file, Tivoli Storage Manager recursively backs up *all* subdirectories under that path, and any instances of the specified file that exist under *any* of those subdirectories.

Note: The server can also define this option.

Preferences File

Place this option in the TSM User Preferences file.

Syntax



Parameters

No Subdirectories are not processed. This is the default.

Yes Subdirectories are processed. Because the client program searches all subdirectories of a directory that is being processed, processing can take longer to complete. Specify *Yes* only when necessary.

Examples

TSM User Preferences:

```
subdir no
```

Tapeprompt

The ***tapeprompt*** option specifies whether you want Tivoli Storage Manager to wait for a tape to mount if it is required for a backup, archive, restore, or retrieve process, or to be prompted for a choice.

In the Tivoli Storage Manager GUI, the Media Mount dialog can display the **Not Available** value in the Device and Volume Label fields if you perform a standard (also known as classic) restore or retrieve operation. This value means that this information is only available for no query restore or retrieve operations; not a standard restore or retrieve operation. The Device field displays the name of the device on which to mount the media needed to process an object. The Volume Label field displays the name of the volume needed to process an object. See "No query restore" on page 33 for a discussion of standard and no query restore operations.

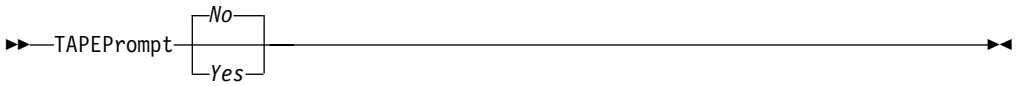
Tape prompting does not occur during a scheduled operation regardless of the setting for the ***tapeprompt*** option.

Note: The server can also define this option.

Preferences File

Place this option in the TSM User Preferences file.

Syntax



Parameters

No You are not prompted for your choice. The server waits for the appropriate tape to mount. This is the default.

Yes You are prompted when a tape is required to back up, archive, restore, or retrieve data. At the prompt, you can wait for the appropriate tape to be mounted, always wait for a tape to be mounted, skip a particular object, skip all objects on a single tape, skip all objects on all tapes, or cancel the entire operation.

Examples

TSM User Preferences:

```
tapeprompt yes
```

Tcpbuffsize

The ***tcpbuffsize*** option specifies the size of the internal TCP/IP communication buffer used to transfer data between the client node and server. Although it uses more memory, a larger buffer can improve communication performance.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza.

Syntax

Parameters

size

Specifies the size, in kilobytes, that you want to use for the internal TCP/IP communication buffer. The range of values is 1 through 512; the default is 16.

Depending on the operating system communication settings, your system might not accept all values in the range of 1 through 512.

Examples

TSM System Preferences:

```
tcpb 2
```

Tcpport

The ***tcpport*** option specifies a TCP/IP port address for a Tivoli Storage Manager server. You can obtain this address from your administrator.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza.

Syntax

Parameters

port_address
Specifies the TCP/IP port address that is used to communicate with a server. The range of values is 1000 through 32767; the default is 1500.

Examples

TSM System Preferences:

```
tcpp 1501
```

Tcpserveraddress

The ***tcpserveraddress*** option specifies the TCP/IP address for a Tivoli Storage Manager server. You can obtain this port address from your administrator.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza.

Syntax

Parameters

server_address
Specifies a 1 to 64 character TCP/IP address for a server.

Examples

TSM System Preferences:

```
tcps dsmchost.xyzcompany.vas.com
```

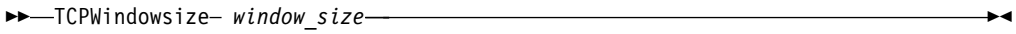
Tcpwindowsize

Use the ***tcpwindowsize*** option to specify, in kilobytes, the size you want to use for the TCP/IP sliding window for your client node. The sending host cannot send more data until it receives an acknowledgment and a TCP receive window update. Each TCP packet contains the advertised TCP receive window on the connection. A larger window allows the sender to continue sending data and may improve communication performance, especially on fast networks with high latency.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza.

Syntax



Parameters

window_size
Specifies the size, in kilobytes, to use for your client node TCP/IP sliding window. The range of values is 1 through 128; the default is 16.

Notes:

1. The TCP window acts as a buffer on the network. It is not related to the ***tcpbuffsize*** option, or to the send and receive buffers allocated in client or server memory.
2. A window size larger than the buffer space on the network adapter might degrade throughput due to resending packets that were lost on the adapter.
3. Depending on the operating system communication settings, your system might not accept all values in the range of values.

Examples

TSM System Preferences:

```
tcpwindowsize 1
```

Timeformat

The ***timeformat*** option specifies the format in which you want to display system time.

Preferences File

Place this option in the TSM User Preferences file.

Syntax

Parameters

format_number

Displays time in one of the formats listed below. Select the format number that corresponds to the format you want to use.

1 23:00:00 (This is the default)
2 23,00,00
3 23.00.00
4 12:00:00 A / P

Examples

TSM User Preferences:

```
timeformat 4
```

Txnbytelimit

The ***txnbytelimit*** option specifies the number of kilobytes the client program buffers before it sends a transaction to the server. A *transaction* is the unit of work exchanged between the client and server. Because the client program can transfer more than one file or directory between the client and server before it commits the data to server storage, a transaction can contain more than one file or directory. This is called a *transaction group*.

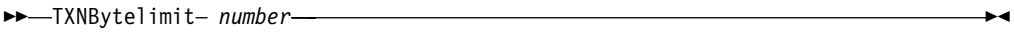
This option permits you to control the amount of data sent between the client and server before the server commits the data and changes to the server database, thus changing the speed with which the client performs work. The amount of data sent applies when files are batched together during backup or when receiving files from the server during a restore procedure.

The server administrator can limit the number of files or directories contained within a transaction group using the ***txngroupmax*** option; the actual size of a transaction can be less than your limit. Once this number is reached, the client sends the files to the server *even if* the transaction byte limit is not reached.

Preferences File

Place this option in the TSM System Preferences file *within* a server stanza.

Syntax



Parameters

number
Specifies the number of kilobytes the client program can buffer together in a transaction before it sends data to the server. The range of values is 300 through 2097152 (2 GB); the default is 2048.

Examples

TSM System Preferences:

```
txnb 2048
```

Verbose

The ***verbose*** option specifies that you want processing information to display on your screen. This is the default.

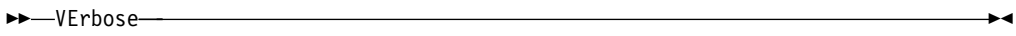
The information displays on your screen in the Scheduler Status window. This option only applies when you are running the scheduler and Tivoli Storage Manager is performing scheduled work.

Note: The server can also define this option.

Preferences File

Place this option in the TSM User Preferences file.

Syntax



Parameters

There are no parameters for this option.

Examples

TSM User Preferences:

```
verbose
```

Virtualnodename

The ***virtualnodename*** option specifies the node name of your workstation when you want to restore or retrieve files to a different workstation.

When you use the ***virtualnodename*** option in your TSM User Preferences file:

- You must specify the name you specified with the ***nodename*** option in your TSM User Preferences file.
- Tivoli Storage Manager prompts for the password assigned to the node you specify, if a password is required. If you enter the correct password, you have access to all backups and archives that originated from the specified node.

When connecting to a server, the client must identity itself to the server. This login identification is determined in the following ways:

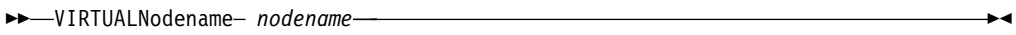
- If the ***nodename*** and ***virtualnodename*** options are not specified, you are prompted for a node name.
- If the ***virtualnodename*** option is specified, it cannot be the same name as the name specified by the ***nodename*** option.

When the virtual node name is accepted by the server, a password is required (assuming authentication is on), even if the ***passwordaccess*** option is *generate.* Once a connection to the server is established, then access is permitted to any file backed up using this login ID.

Preferences File

Place this option in the TSM User Preferences file.

Syntax



Parameters

nodename
Specifies a 1- to 64-character name that identifies the node for which you want to request Tivoli Storage Manager services. There is no default.

Examples

TSM User Preferences:

```
virtualnodename cougar
```

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Glossary

The terms in this glossary are defined as they pertain to the IBM Tivoli Storage Manager library. If you do not find the term you need, refer to the IBM Software Glossary on the Web at this address: www.ibm.com/ibm/terminology/. You can also refer to IBM Dictionary of Computing, New York: McGraw-Hill, 1994.

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- The *Information Technology Vocabulary*, developed by Subcommittee 1, Joint Technical Committee 1, of the International Organization for Standardization and the International Electrotechnical Commission (ISO/IEC JTC2/SC1).

A

absolute. A copy group mode value that indicates a file is considered for incremental backup even though the file has not changed since the last time it was backed up. See *mode*. Contrast with *modified*.

access control list (ACL).

1. In computer security, a collection of all access rights for one object.
2. In computer security, a list associated with an object that identifies all the subjects that can access the object and their access rights; for example, a list associated with a file that identifies users who can access the file and identifies their access rights to that file.

ACL. access control list

active policy set. The policy set within a policy domain that contains the most recently activated policy. All client nodes assigned to the current policy domain use this policy set. See *policy set*.

active version. The most recent backup copy of a file stored in Tivoli Storage Manager storage for a file that currently exists on a file server or workstation. An active version remains active and exempt from deletion until:

- Replaced by a new backup version.
- Tivoli Storage Manager detects, during an incremental backup, that the user has deleted the original file from a file server or workstation.

administrative client. A program that runs on a file server, workstation, or mainframe. This program lets administrators monitor and control Tivoli Storage Manager servers using administrator commands. Contrast with *backup-archive client*.

administrator. A user who is registered to the server as an administrator. Administrators may possess one or more privilege classes. Administrators can use the administrative client to enter Tivoli Storage Manager server commands and queries according to their privileges.

aggregate data transfer rate. Dividing the total number of bytes transferred by the elapsed processing time calculates the data transfer rate.

archive. A function permitting users to copy one or more files to a long-term storage device. Archive copies can:

- Carry associated descriptive information
- Be compressed to minimize storage requirements
- Be retrieved by archive date, file name, or description

Contrast with *retrieve*.

archive copy. A file or group of files residing in an archive storage pool in Tivoli Storage Manager storage.

archive copy group. A policy object containing attributes that control the generation, destination, and expiration of archived files. The archive copy group belongs to a management class.

archive retention grace period. The number of days Tivoli Storage Manager retains an archived copy when the server is unable to rebind the file to an appropriate management class.

authentication. The process of checking and authorizing a user's password before permitting user access to the Tivoli Storage Manager server. An administrator with system privilege can enable or disable authentication.

authorization rule. A specification permitting another user to either restore or retrieve a user's files from Tivoli Storage Manager storage.

Authorized User. A user who has administrative authority for the Tivoli Storage Manager client on a workstation. This user changes passwords, performs open registrations, and deletes file spaces. An Authorized User is any user running with a real user ID of 0 (root) or a user who owns an executable whose owner execution permission bit is set to **s**. In the following example, the user **tivoli** is an Authorized User while running `dsmc` since the `dsmc` owner execution permission bit is set to **s**:

```
-rwsr-xr-x  1  tivoli  dsmdev  2880479  Nov  5 13:42   Tivoli Storage Manager
```

B

backup. A function permitting users to copy one or more files to a storage pool to protect against data loss. Contrast with *restore*.

backup-archive client. A program that runs on a file server, PC, or workstation and provides a means for users to back up, archive, restore, and retrieve files. Contrast with *administrative client*.

backup copy group. A policy object that contains attributes controlling the generation, destination, and expiration of backup files. The backup copy group belongs to a management class.

backup retention grace period. The number of days Tivoli Storage Manager retains a backup version when the server is unable to rebind the file to an appropriate management class.

backup set. A collection of active files in your file spaces that reside on the Tivoli Storage Manager server. The Tivoli Storage Manager administrator creates the backup set and copies it onto portable media device that is supported by the Tivoli Storage Manager server and client.

backup version. A backed up file, directory, or file space that resides in a backup storage pool in Tivoli Storage Manager storage. The *active* version is the most recent backup version. See *active version* and *inactive version*.

binding. The process of associating a file with a management class name.

boot. To prepare a computer system for operation by loading an operating system.

C

central scheduling. A function permitting an administrator to schedule backup and archive operations from a central location. Schedule operations on a periodic basis or on an explicit date.

client. A program running on a file server, PC, workstation, or terminal that requests services of another program called the server. There are two types of Tivoli Storage Manager clients: administrative and backup-archive. See *administrative client* and *backup-archive client*.

client domain. The set of drives, file systems, or volumes selected by a user for processing during a backup or archive operation.

client node. A file server or workstation registered with the server on which the backup-archive client program is installed.

client polling. A client and server communication technique where the client node queries the server for scheduled work.

client/server. A communications network architecture in which one or more programs (clients) request computing or data services from another program (the server).

closed registration. A registration process in which a Tivoli Storage Manager administrator must register workstations as client nodes with the server. Contrast with *open registration*.

command-click (Macintosh). Click on an item while pressing the Command key. In file and folder lists, this deselects individual items embedded in a group of selected items.

command line interface. A type of user interface where commands are specified on the command line. Contrast with *graphical user interface.*

communication method. The method by which a client and server exchange information. For Tivoli Storage Manager backup-archive clients, the method can be TCP/IP. See *Transmission Control Protocol/Internet Protocol.*

communication protocol. A set of defined interfaces that permits computers to communicate with each other.

copy group. A policy object that contains attributes that control backup and archive file:
- Generation
- Destination
- Expiration.

Backup and archive copy groups belong to management classes. See *frequency*, *destination*, *mode*, *retention*, *serialization*, and *version*.

D

default management class. A management class assigned to a policy set. This class is used to govern backed up or archived files when a user does not explicitly associate a file with a specific management class through the include-exclude list.

destination. A copy group attribute that specifies the storage pool in which to back up or archive a file. At installation, Tivoli Storage Manager provides two storage destinations named **backuppool** and **archivepool**.

domain. See *policy domain* or *client domain*.

drag. Move the mouse while holding down the mouse button, thus moving the selected object.

drag-and-drop. Move (drag) an object on top of another object and release the mouse button, thus relocating the object.

dsm.opt file. See *options file.* . Also called client options file.

dynamic. A copy group serialization value that specifies Tivoli Storage Manager accept the first attempt to back up or archive an object, regardless of any changes made during backup or archive processing. See *serialization*. Contrast with *shared dynamic*, *shared static*, and *static*.

E

error log. A text file written on disk that contains Tivoli Storage Manager processing error messages. The Tivoli Storage Manager server detects and saves these errors.

exclude. To identify files in an include-exclude list that you do not want to include in a specific client operation, such as backup or archive.

exabyte (EB). (1) For processor storage, real and virtual storage, and channel volume, 1,152,921,504,606,846,976 bytes. (2) For disk storage capacity and communications volume, 1,000,000,000,000,000,000 bytes.

expiration. The process in which files are identified for deletion because their expiration date or retention period is passed. Backups or archives are marked for deletion based on the criteria defined in the backup or archive copy group.

expiring file. A migrated or premigrated file that is marked for expiration and removal from Tivoli Storage Manager storage. If a stub file or an original copy of a premigrated file is deleted from a local file system, or if the original copy of a premigrated file is updated, the corresponding migrated or premigrated file is marked for expiration the next time reconciliation is run. It expires and is removed from Tivoli Storage Manager storage after the number of days specified with the ***migfileexpiration*** option have elapsed.

F

file server. A dedicated computer and its peripheral storage devices connected to a local area network that stores both programs and files shared by users on the network.

file space. A logical space on the Tivoli Storage Manager server that contains a group of files. In Tivoli Storage Manager, users can restore, retrieve, or delete file spaces from Tivoli Storage Manager storage. A file space for systems:

- **Windows**— file spaces for removable media are identified by volume label. Fixed drive file spaces are identified by Universal Naming Convention (UNC) name.
- **UNIX** — Logical space that contains a group of files backed up or archived from the same file system, or part of a file system defined with the virtualmountpoint option in the client system options file.

frequency. A copy group attribute that specifies the minimum interval, in days, between incremental backups.

fuzzy backup. A backup version of a file that might not accurately reflect what is currently in the file because the file was backed up at the same time as it was being modified.

fuzzy copy. An archive copy of a file that might not accurately reflect what is currently in the file because Tivoli Storage Manager archived the file while the file was being modified.

G

generate password. Processing that stores a new password in an encrypted password file when the old password expires. Automatic generation of a password prevents password prompting. Password generation can be set in the options file (passwordaccess option). See *options file.*

gigabyte (GB). (1) One billion (10^9) bytes. (2) When referring to memory capacity, 1 073 741 824 in decimal notation.

graphical user interface (GUI). A graphical user interface offers pictoral rather than text-based access to a computer. A graphical user interface includes:

- A combination of graphics and icons
- Use of a mouse or pointing device
- Menu bars, dropdown lists, and overlapping windows

Contrast with *command line interface*. See *windowed interface.*

GUI. Graphical user interface.

H

hierarchical storage management client. A program that runs on a workstation or file server to provide space management services. The hierarchical storage management client automatically migrates eligible files to Tivoli Storage Manager storage to maintain specific levels of free space on local file systems. Automatic recalls are made for migrated files when they are accessed. Users are also permitted to migrate and recall specific files.

HSM. Hierarchical Storage Management.

I

inactive version. A copy of a backup file in Tivoli Storage Manager storage that either is not the most recent version, or the corresponding original file was deleted from the client file system. Inactive backup versions are eligible for expiration according to the management class assigned to the file.

include-exclude file. A file containing statements to determine the files to back up and the associated management classes to use for backup or archive. See *include-exclude list*.

include-exclude list. A list of include and exclude options that include or exclude selected files for backup. An exclude option identifies files that should not be backed up. An include option identifies files that are exempt from the exclusion rules or assigns a management class to a file or a group of files for backup or archive services. The include-exclude list is defined in one or more include-exclude files or in the client options file. . See *options file.*

incremental backup. A function that permits user to back up new or changed files or directories from a client domain or from specified directories or files. These directories or files are not excluded in the include-exclude list and meet the requirements for frequency, mode, and serialization as defined by a backup copy group of the management class assigned to each file. Contrast with *selective backup*.

IPL. Initial Program Load. See *boot* and *reboot*.

L

LAN. Local area network.

Local Area Network (LAN). A variable-sized communications network placed in one location. LAN connects servers, PCs, workstations, a network operating system, access methods, and communications software and links.

logical unit number (LUN). A logical unit number (LUN) is a unique identifier used on a SCSI bus that enables it to differentiate between up to eight separate devices (each of which is a logical unit). Each LUN is a unique number that identifies a specific logical unit, which may be a hard disk, tape drive, or other device which understands the SCSI protocol.

M

management class. A policy object that is a named collection of copy groups. A management class is associated with a file to specify how the server should manage backup versions or archive copies of workstation files. See *binding* and *copy group*.

mode. A copy group attribute that specifies whether a backup file should be created for a file that was not modified since the last time the file was backed up. See *absolute* and *modified*.

modified. A backup copy group attribute indicating a file is considered for backup only if the file has been changed since the last backup. A file is considered changed if the date, size, owner, or permissions have changed. See *absolute* and *mode*.

N

network data transfer rate. The data transfer rate calculated by dividing the total number of bytes transferred by the data transfer time. For example, the time spent transferring data over the network.

node. See *client node*.

node name. A unique name used to identify a workstation, file server, or PC to the server.

non-Unicode file space. Non-Unicode file spaces and file names are limited to the character set of the current locale when the files were backed up.

O

open registration. A registration process in which users can register their own workstations or PCs as client nodes with the server. Contrast with *closed registration*.

options file. A file that contains processing options.

- **dsm.opt**
- **TSM User Preferences file**

For the Macintosh client only: Identifies Tivoli Storage Manager servers to contact, specifies communication methods, defines scheduling options, selects backup, archive, restore, and retrieve options.

- **TSM System Preferences file**

  For the Macintosh client only: Contains stanzas describing Tivoli Storage Manager servers to contact for services. These stanzas also specify communication methods, backup and archive options, and scheduling options.

owner. The owner of backup-archive files sent from a multi-user client node, such as AIX.

P

pattern-matching character. See *wildcard character*.

plug-in. A self-contained software component that modifies (adds or changes) function in a particular software system. When you add a plug-in to a software system, the foundation of the original software system remains intact.

policy domain. A policy object that contains one or more policy sets. Client nodes are associated with a policy domain. See *policy set*, *management class*, and *copy group*.

policy set. A policy object that contains a group of management class definitions that exist for a policy domain. At any one time, there can be many policy sets within a policy domain, but only one policy set can be active. See *active policy set* and *management class*.

progress indicator. A control used to inform a user about the progress of a process.

R

reboot. To restart the operating system.

registration. The process of identifying a client node or administrator to the server by specifying a user ID, password, and contact information. For client nodes, a policy domain, compression status, and deletion privileges are also specified.

restore. A function that permits users to copy a version of a backup file from the storage pool to a workstation or file server. The backup copy in the storage pool is not affected. Contrast with *backup*.

retention. The amount of time, in days, that inactive backed up or archived files are retained in the storage pool before they are deleted. The following copy group attributes define retention: retain extra versions, retain only version, retain version.

retrieve. A function permitting users to copy an archived file from the storage pool to the workstation or file server. The archive copy in the storage pool is not affected. Contrast with *archive*.

S

scheduling mode. The type of scheduling operation for the client-server node. Tivoli Storage Manager supports two scheduling modes: client-polling and server-prompted.

scroll. Move through a list of items in a window by operating the scrollbars with the mouse cursor.

select. Choose an item from a list or group of items.

selective backup. A function permitting users to back up specified files. These files are not excluded in the include-exclude list and meet the requirement for serialization in the backup copy group of the management class assigned to each file. Contrast with *incremental backup*.

serialization. A copy group attribute that specifies whether a file can be modified during a backup or archive operation. See *static*, *dynamic*, *shared static*, and *shared dynamic*.

server. A program running on a mainframe, workstation, or file server that provides shared services such as backup and archive to other various (often remote) programs (called clients).

server-prompted scheduling. A client-server communication technique where the server contacts the client node when tasks need to be done.

session. A period of time in which a user can communicate with a server to perform backup, archive, restore, or retrieve requests.

shared dynamic. A Tivoli Storage Manager copy group serialization mode. This mode specifies if a file changes during backup or archive and continues to change after a number of retries. The last retry commits the file to the Tivoli Storage Manager server whether or not the file changed during backup or archive. Contrast with *dynamic*, *shared static*, and *static*.

shared static. A copy group serialization value specifying that a file must not be modified during a backup or archive operation. Tivoli Storage Manager attempts to retry the operation a number of times. If the file is in use during each attempt, the file is not backed up or archived. See *serialization*. Contrast with *dynamic*, *shared dynamic*, and *static*.

share point. A drive or directory on Windows 2000, XP, and .NET whose files are available for shared access across a network. The share point name is part of a UNC name. See *Universal Naming Convention (UNC)* name.

shift-click. Click on an item while pressing the Shift key.

space management. The process of keeping sufficient free storage space available on a local file system for new data and making the most efficient and economical use of distributed storage resources.

stabilized file space. A file space that exists on the server but not on the client. This situation can arise in at least two instances:
1. A drive is removed from a client workstation
2. A file space is renamed on the server

Stabilized file spaces remain on the server until deleted by the user or administrator. Files and directories can be restored and retrieved from a stabilized file space. However, it is not possible to back up or archive data to a stabilized file space.

stanza. In the AIX OS, a stanza is a group of lines in a file that together have a common function or define a part of the system. The Tivoli Storage Manager Client System Options file (**dsm.sys**) contains a stanza for each server to which the client can connect. Each stanza begins with the ***servername*** option and ends at the next ***servername*** option or the end of file, whichever comes first. Each stanza must include communications options.

static. A copy group serialization value specifying that a file must not be modified during a backup or archive operation. If the file is in use during the first attempt, Tivoli Storage Manager will not back up or archive the file. See *serialization*. Contrast with *dynamic*, *shared dynamic*, and *shared static*.

storage pool. A named set of storage volumes used as the destination of backup, archive, or migrated copies.

T

TCA. Trusted Communications Agent

TCP/IP. Transmission Control Protocol/Internet Protocol.

timeout. A time event involving:
- An event that happens at the end of a predetermined period of time that began at the happening of another specified event.
- A time interval allotted for certain operations to happen. For example, response to polling or addressing before system operation is interrupted and must be restarted.
- A terminal feature that logs off a user if an entry is not made within a specified period of time.

Tivoli Storage Manager. A client-server licensed program product that provides storage management and data access services to customers in a multivendor computer environment.

Transmission Control Protocol/Internet Protocol (TCP/IP). A standard set of communication protocols that supports peer-to-peer connectivity of functions for both local and wide-area networks.

TSM System Preferences file. An editable file that contains communication, authorization, central scheduling, backup, and archive options.

TSM User Preferences file. A file, used on Macintosh clients, that contains processing options. A sample of this file is provided during the initial installation and setup of Tivoli Storage Manager. A copy of the sample defaults file can be created to set up precise processing options.

V

version. Storage management policy may allow back-level copies of backed up objects to be kept at the server whenever an object is newly backed up. The most recent backed up copy is called the ″active″ version. Earlier copies are ″inactive″ versions. The following backup copy group attributes define version criteria: versions data exists, and versions data deleted.

W

wildcard character. An asterisk (*) or question mark (?) character used to represent multiple (*) or single (?) characters when searching for various combinations of characters in alphanumeric and symbolic names.

windowed interface. A type of user interface that is either a graphical user interface or a text-based interface. The text-based interface maintains a close affinity to the graphical user interface, including action bars and their associated pull-down menus and windows. See *graphical user interface.*

workstation. A programmable high-level workstation (usually on a network) with its own processing hardware such as a high-performance personal computer. In a local area network, a personal computer that acts as a single user or client. A workstation can also be used as a server.

world wide name. A unique 48 or 64 bit number assigned by a recognized naming authority (often via block assignment to a manufacturer) that identifies a connection or a set of connections to the network. Abbreviated WWN. A WWN is assigned for the life of a connection (device). Most networking technologies (e.g., Ethernet, FDDI, etc.) use a world wide name convention.

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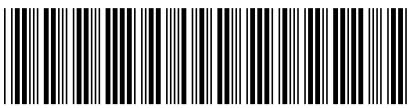

Spine information:

IBM Tivoli Storage Manager
for Macintosh

Backup-Archive Clients Installation and User's Guide

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Release 2